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CYTOPATHOLOGY DIAGNOSIS OF LUNG DISEASE IN CONCORDANCE WITH HISTOPATHOLOGY

[*1]Dr. Noor Salim Rashid and [2]Dr. Muhsin A. Sahib

[1]Medical City, Baghdad, Iraq.
[2]Consultant cytopathology's, Medical city, Baghdad, Iraq.

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***Corresponding Author: Dr. Noor Salim Rashid**
Medical City, Baghdad, Iraq.

ABSTRACT

Introduction: Carcinoma of lung is one of the most important malignancy that cause of high mortality rate in the developed states. The recognition rate of initial phase lung malignancy is essential for improving the diagnosis. The aim of study is to evaluate the percentage of concordance between cytological and histological diagnosis of lung disease. **Method:** across sectional study of 40 patients with different lung diseases, that were collected from archive of specialist surgical hospital in Baghdad medical city, specialist surgical hospital, Baghdad, Iraq. in period from 2019-2022, where the variables taken, histopathological reports, cytopathological reports, age, gender, type of sample. **Results:** 40 cases mean age (54.35 ± 17), 13 (32.5%) of patients are females and 27 (67.5%) are males. 19 (47.5%) are at age > 60 years old. 17 (42.5%) of patients the tumor location at right lung while 16 (40%) of them at left lung. 27 (67.5%) of patients with positive histology while 16 (40%) of them are positive cytology. 23 (57.5%) of patients with bronchial wash as type of aspiration. the distribution of histology in details.8 (20%) of patients with adenocarcinoma, 5 (12.5%) of the are small cell while 13 (32.5%) are negative histology. the distribution of histology in details. 6 (%) of patients with non-significant type, 3 (7.5%) of the are small cell while 24 (60 %) are negative cytology. 5 (31%) of patients with positive cytology is adenocarcinoma, 4 (25%) of patients with positive cytology is non-small cell, 3 (18.8%) of patients with positive cytology is small cell. **Conclusion:** Current study concludes that the most of patients with lung disease are old age males, the most site of lung tumor are right site. The most histological type is adenocarcinoma and the most cytological types that associate with positive histology are non-small cell, small cell carcinoma.

KEYWORDS: Cytopathology diagnosis, lung disease, concordance, histopathology.

INTRODUCTION

Carcinoma of lung is one of the most important malignancy that cause of high mortality rate in the developed states. The recognition rate of initial phase lung malignancy is essential for improving the diagnosis. Diagnosis of carcinoma of lung made in two methods: "histopathological and cytopathological". Progressively cytology samples are used for the main identification of lung tumors and to achieve additional scholarships.[1] Cytological methods in the identification of benign and malignant tumors of the lungs. Flexible fiber optic bronchoscope is important to obtain a samples for cytological assessment.[2] Contact to numerous ecological elements like airborne microbes, normal allergens, car exhaust gasses and smoking lead to a massive collection of pulmonary illnesses fluctuating from infection to tumors which explanation the mortality and morbidity rate international. Early diagnosis is obligatory to managing them effectively. Lung Ca. is cause of death in developing nations.[3] Cytology is non/minimally invasive process for assessment of pulmonary growth plays an important part in patients where biopsy not be tried because great danger of bleeding.[4,5] "Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA)" has a great improvement in the mediastinal presentation of Ca. of lung.[6] Due to high analytic correctness, informal availability to hilar nodes, and least invasiveness, "EBUS-TBNA" has broadly useful in analytic bronchoscopy. EBUS-TBNA have a broader range of mediastinal lymph nodes.[7] Due to of fresh progresses in the hereditary identification of lung Ca., gaining an adequate tissue essential for immunohistochemically discoloration and transformation revisions.[8,9] The aspirates from EBUS-TBNA are processed into tissue centers for hematoxylin and eosin (H&E) staining and the remainder aspirates used for Papanicolaou

discoloration.[10] Adenocarcinoma is a malignant epithelial tumor with glandular differentiation or mucin production by the tumor cells. Adenocarcinoma appear in cytological material as single cells and cell groups consist of ball like clusters, papillary fragments, loose clusters or true acini with central Lumina. The cytoplasm is homo extremely vacuolated, round to oval enlarged nuclei and finely granular chromatin. Central macronucleoli is a prominent feature of adenocarcinoma of acinar type. two morphologic signs of glandular differentiation, often found together are formation of tubules or papillae and secretion of mucin were taken as clues for adenocarcinoma.[11,12] The aim of study is to evaluate the percentage of concordance between cytological and histological diagnosis of lung disease.

METHOD

across sectional study of 40 patients with different lung diseases, that were collected from archive of specialist surgical hospital in Baghdad medical city, specialist surgical hospital, Baghdad, Iraq. in period from 2019-2022, where the variables taken, histopathological reports, cytopathological reports, age, gender, type of sample. Statistical analysis done by SPSS 22, frequency and percentage used for categorical data, mean, median and SD for continuous data. Chi-square used for assessed association between variables. P-value less or equal to 0.05 is consider significant.

RESULTS

Cross sectional study, 40 cases mean age (54.35 ± 17), 13 (32.5%) of patients are females and 27 (67.5%) are males. 19 (47.5%) are at age > 60 years old. 17 (42.5%) of patients the tumor location at right lung while 16 (40%) of them at left lung. 27 (67.5%) of patients with positive histology while 16 (40%) of them are positive cytology. 23 (57.5%) of patients with bronchial wash as type of aspiration. As show in table 1.

Table 1: distribution of variables.

variables		frequency	percentage
Gender	***female***	13	32.5
	male	27	67.5
	11-20	1	2.5
	21-30	4	10.0
Age groups	***31-40***	5	12.5
	41-50	4	10.0
	51-60	7	17.5
	>60	19	47.5
	central	1	2.5
Site	***left***	16	40.0
	pleural	6	15.0
	right	17	42.5
Histology	***negative***	13	32.5
	positive	27	67.5
Cytology	***negative***	24	60.0
	positive	16	40.0
	aspiration	2	5.0
Types of aspiration	***bronchial wash***	23	57.5
	cystic aspiration	1	2.5
	pleural fluid	11	27.5
	sputum	3	7.5

As show in fig 1; the distribution of histology in details.8 (20%) of patients with adenocarcinoma, 5 (12.5%) of the are small cell while 13 (32.5%) are negative histology.

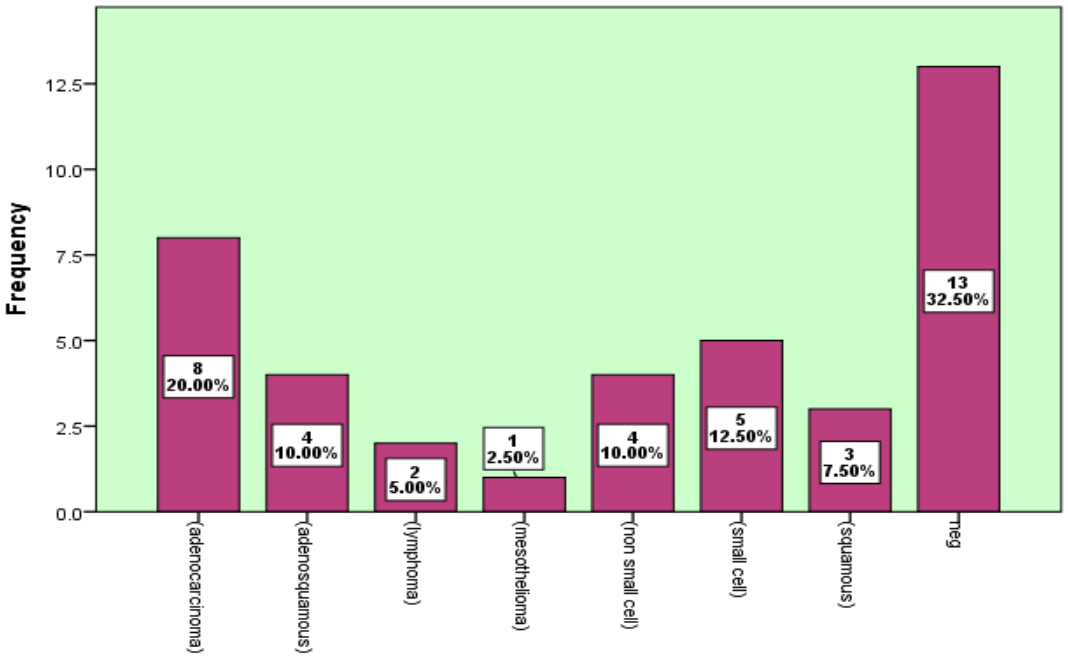

Fig 1: distribution of histology in details.

As show in fig 2; the distribution of cytology in details. 6 (%) of patients with non-significant type, 3 (7.5%) of the are small cell while 24 (60 %) are negative cytology.

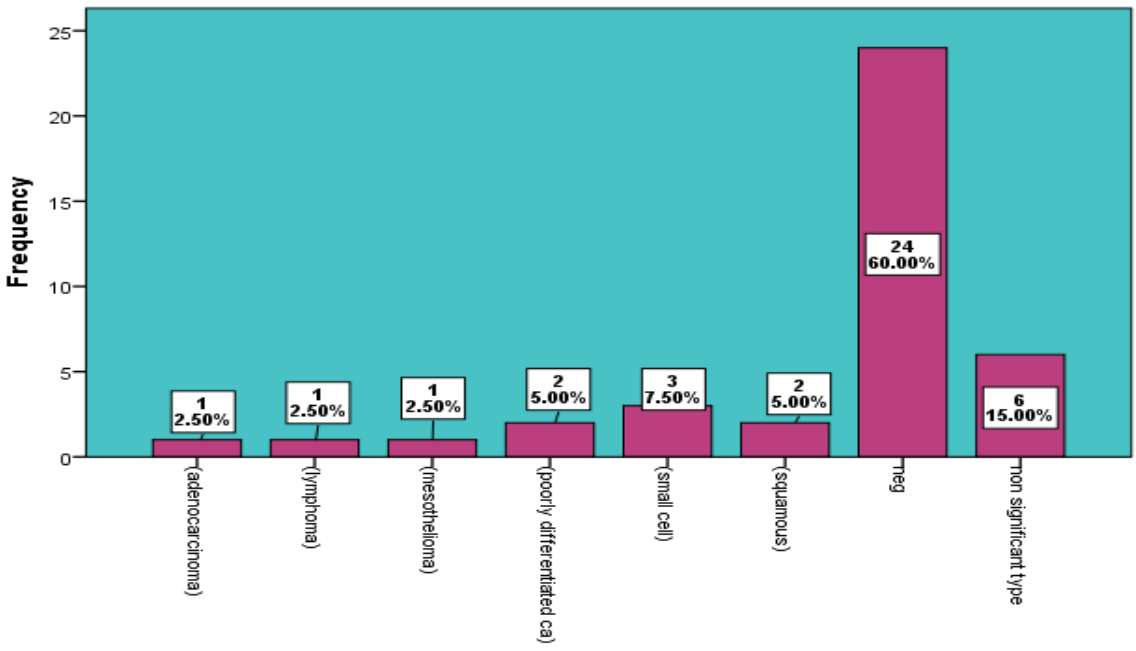

Fig (2): distribution of cytology in details.

As show in table 2; there is no significant association between (gender, age groups, site of tumor, types of aspiration) and histology.

Table (2): association between histology and study variables.

variables			Histology	P-value
		Negative	Positive	
	females	7	6	
		53.8%	22.2%	
Gender	***males***	6	21	0.07
		46.2%	77.8%	
	Total	13	27	
		100.0%	100.0%	
	11-20	1	0	
		7.7%	0.0%	
Age groups	***21-30***	2	2	
		15.4%	7.4%	0.66
	31-40	4	1	
		30.8%	3.7%	
	41-50	1	3	
		7.7%	11.1%	
	51-60	2	5	
		15.4%	18.5%	
	>60	3	16	
		23.1%	59.3%	
	Total	13	27	
		100.0%	100.0%	
	central	1	0	
		7.7%	0.0%	
Site	***left***	5	11	0.3
		38.5%	40.7%	
	pleural	3	3	
		23.1%	11.1%	
	right	4	13	
		30.8%	48.1%	
	Total	13	27	
		100.0%	100.0%	
	FNA	0	2	
Types of		0.0%	7.4%	
aspiration	***bronchial wash***	9	14	
		69.2%	51.9%	
	cystic aspiration	1	0	0.3
		7.7%	0.0%	
	pleural fluid	3	8	
		23.1%	29.6%	
	sputum	0	3	
		0.0%	11.1%	
	Total	13	27	
		100.0%	100.0%	

P-value ≤ 0.05 (significant).

As show in table 3; there is no significant association between (gender, age groups, site of tumor, types of aspiration) and cytology.

Table 3: association between cytology and study variables.

variables		Cytology		P-value
		Negative	**Positive**	
Gender	***females***	9 37.5%	4 25.0%	0.5
	males	15 62.5%	12 75.0%	
	Total	24 100.0%	16 100.0%	
Age groups	***11-20***	1 4.2%	0 0.0%	0.16
	21-30	4 16.7%	0 0.0%	
	31-40	4 16.7%	1 6.3%	
	41-50	3 12.5%	1 6.3%	
	51-60	2 8.3%	5 31.3%	
	>60	10 41.7%	9 56.3%	
	Total	24 100.0%	16 100.0%	
Site	***central***	0 0.0%	1 6.3%	0.6
	left	10 41.7%	6 37.5%	
	pleural	4 16.7%	2 12.5%	
	right	10 41.7%	7 43.8%	
	Total	24 100.0%	16 100.0%	
Types of aspiration	***aspiration***	2 8.3%	0 0.0%	0.4
	bronchial wash	15 62.5%	8 50.0%	
	cystic aspiration	1 4.2%	0 0.0%	
	pleural fluid	5 20.8%	6 37.5%	
	sputum	1 4.2%	2 12.5%	
	Total	24 100.0%	16 100.0%	

P-value ≤ 0.05 (significant).

As show in table 4; there is significant association between histology and cytology, 15 (93.8%) of patients with positive cytology have positive histology, 12 (50%) of patients with negative cytology have negative histology.

Table 4: association between cytology and histology in general.

variables			Cytology	P-value
		Negative	**Positive**	
	negative	12	1	
		50.0%	6.3%	**0.005**
Histology in	***positive***	12	15	
general		50.0%	93.8%	
	Total	24	16	
		100.0%	100.0%	

P-value ≤ 0.05 (significant).

As show in table 5; there is significant association between cytology and histology in details, 5 (31%) of patients with positive cytology is adenocarcinoma, 4 (25%) of patients with positive cytology is non-small cell, 3 (18.8%) of patients with positive cytology is small cell.

Table 5: association between cytology and histology in details.

variables		Cytology		P-value
		Negative	Positive	
	(adenocarcinoma)	3	5	
		12.5%	31.3%	
	(adenosquamous)	3	1	
		12.5%	6.3%	
	(lymphoma)	2	0	
Histology in		8.3%	0.0%	
details	***(mesothelioma)***	0	1	**0.015**
		0.0%	6.3%	
	(non-small cell)	0	4	
		0.0%	25.0%	
	(small cell)	2	3	
		8.3%	18.8%	
	(squamous)	2	1	
		8.3%	6.3%	
	negative	12	1	
		50.0%	6.3%	
	total	24	16	
		100.0%	100.0%	

P-value ≤ 0.05 (significant).

DISCUSSION

Cytology is increasingly being used in the evaluation of lung lesions. There are several potential pitfalls and mimics encountered in the evaluation of respiratory cytology specimens, making interpretation of respiratory cytology challenging. Familiarity with the mimics and the pitfalls is essential in avoiding a misdiagnosis because a false positive or false negative diagnosis may have significant management implications.[11] Based on cytomorphology, cytodiagnosis was provided and correlated with histopathological diagnosis in patients who underwent bronchoscopic biopsy.[11] In the current study the mean age (54.35 ± 17), 13 (32.5%) of patients are females and 27 (67.5%) are males. 19 (47.5%) are at age > 60 years old, this is similar to other study that also show the same results that stated 110 males and 22 females most age group 60 and more.[11] In current study most of patient with adenocarcinoma as histological diagnosis, while positive for carcinoma with no determined type as cytological diagnosis. In current study there is significant association between cytology and histology in details, 5 (31%) of patients with positive cytology is adenocarcinoma, 4 (25%) of patients with positive cytology is non-small cell, 3 (18.8%) of patients with positive cytology is small cell. Pulmonary adenocarcinoma originates in a peripheral site and has numerous alternatives including "acinar, papillary, mixed acinar papillary, and solid". Bronchoscopy-aided cytological sampling is important in the evaluation of pulmonary adenocarcinoma. Cytological sample done as a daily care process; henceforth, it adds as an extra advantage as hospitalization is escaped.[13] Bronchoscopy and directed methods production a conclusive part in the analysis of endobronchial lesions. Bronchoscopy delivers straight imagining of the airways and documents focused sampling of the growth with high produce of cells/tissue.[14,15] The cellular produce of pulmonary cytology samples and cytomorphology is more affected by technical influences. The occurrence of inflammation, necrotic wreckage, and serious artefact has an influence on the analytic effectiveness of cytology examples. Fast and acceptable fixation of cytology samples are also important as unnecessary air aeration artefact leads to incorrect diagnosis.[15,16] This outcome was in concordance with the consequences of the revisions showed by Chaudhary *et al*., Gaur *et al*. and Rawat *et al*.[14, 16, 17] BAL cytology is an extremely sensitive and exact examination for identification of lung carcinoma.[18] Binesh *et. al*.[19] the detect rate for malignancy was 39% with low sensitivity for an identification of lung carcinoma. The classification of NSCLC into squamous cell and adenocarcinoma is an important as the management procedure of both these tumors. In this study, an attempt was made to categorize the lesions grounded on cytomorphology.[20] In current study 2 cases have false negative results after retrospective evaluation the causes of these false negative is; Sampling error, Type of sampling, Specimen contamination, Location of tumor, stage and size of

tumor, Fewer adjustments of needle, Complications from sampling such as pneumothorax, bleeding.

CONCLUSION

Current study concludes that the most of patients with lung disease are old age males, the most site of lung tumor are right site. The most histological type is adenocarcinoma, while the most cytological types that associate with positive histology are non-small cell and small cell carcinoma.

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