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ORIGINAL ARTICLE

Comparative Study of Histopathological and Immunohistochemical Features of Biopsies of Patients of Lung Cancer

SADIA ISLAM[1], AYESHA ANWAR[2], SHAMILA TAHIR[3], ASMA KAZI[4], AISHA AZIZ[5], HASSAN FAROOQ[6]
[1]*Assistant Professor Department of Physiology Rashid Latif Medical College Lahore*
[2]*Histopathology resident Combined Military Hospital, Multan.*
[3]*Assistant Professor Pathology Loralai medical college Loralai*
[4]*Associate Professor Medicine Department of Medicine Rashid Latif Medical College*
[5]*Assistant Professor Medicine Department of Medicine Rashid Latif Medical College*
[6]*Assistant Professor. Department of Pharmacology. Allama Iqbal Medical College Lahore, Pakistan.*
Correspondence to: Sadia Islam

ABSTRACT

Introduction: When it comes to pollution, smoking, infections, tuberculosis (TB), and allergies, the lungs are the most sensitive organs to damage. Pleural fluid is a fluid that fills the parietal and visceral layers of the pleura that surround the lungs and helps to keep them moist. An investigation of the link between age, gender, and immunohistochemistry findings in lung and pleural biopsy samples was conducted.

Materials and procedures: This is a four-year retrospective study that will take place between May 2017 and May 2021. In the current study, a total of 112 cases were submitted for histological investigation, with 100 instances using lung biopsy and 12 cases involving pleural biopsy being the most prevalent. Immunohistochemical testing was carried out as and when it was necessary.

Results: A total of 100 lungs were examined. There were 56 cases of neoplastic tumours, 35 cases of non-neoplastic tumours, and nine cases of inconclusive tumours. The most common type of cancer was squamous cell carcinoma. The most prevalent non-neoplastic lesion was angioedema, which was the most common type of lesion (4 percent). Patients with lung tumours who have malignancy outweigh those who have inflammatory illnesses at our institution. Seven of the 11 pleural biopsy cases were malignant, whereas the other eleven were not. Adenocarcinoma was the most common kind of neoplastic pleural lesion, followed by tuberculosis.

Conclusion: The use of histopathology in the diagnosis of lung and pleural lesions is essential. It is possible to increase the accuracy of histological diagnosis with the use of immunohistochemistry.

Keywords: Lung biopsy, pleural biopsy, histopathological examination.

INTRODUCTION

Since years, lung cancer has been the most often diagnosed and most lethal of all cancers. When it comes to cancer-related death 27 percent, lung cancer is the leading cause, with 1.58 million new cases diagnosed each year. Lung cancer is diagnosed at a rate of 1800 new cases each year . Squamous cell carcinoma is most commonly found in the centre of the lungs. These tumours are more likely than adenocarcinomas on the lungs' margins to cause symptoms such as blood coughing sooner in their development. Despite modest advances in treatment over the preceding few decades, lung cancer still has a terrible prognosis in most cases. Pleural diseases, which affect the parietal and visceral pleurae and result in pleural effusions, are classified as follows: Primary parietal pleural malignancies spread to the visceral pleura, whereas metastatic sickness (for example, bronchogenic carcinoma) spreads from the visceral pleura to the parietal pleura (and vice versa). Pleural biopsy offers a greater diagnostic yield and sensitivity than other types of biopsy. Immunohistochemistry also helps to increase the accuracy of diagnostic tests. Biopsy not only distinguishes between benign and malignant lesions, but it also aids in the classification of tumours, allowing for the earlier initiation of specialised therapies such as chemotherapy or surgery.

MATERIAL AND METHODS

This research was completed in four years . Formalin-fixed lung and pleural biopsy tissues were processed in an automated tissue processor in the instance of 100 patients. The biopsies were subjected to histological examination (H & E stain). The effects of age, gender, and histological morphology were investigated in depth in this study.

RESULTS

A total of 100 lung and 12 pleural biopsies were taken for the investigation. 72 men and 28 women underwent lung biopsy procedures in a total of 100 patients. There were between 20 and 80 occurrences, with the bulk occurring between 50 and 70 times. The average age was 62.3. Transthoracic and bronchoscopy guided biopsies found 56 neoplastic patients (56 percent) and 63 non-neoplastic patients (63 percent) among the participants.7 instances were malignant (7 percent). Clinically and radiologically, no malignancy was found in any of the 19 individuals studied. The most common kind of lung cancer was squamous cell carcinoma (29 percent), which was followed by adenocarcinoma 14 percent. Both cancers were seen in male patients. Small cell carcinoma was found in nine more cases in male patients, which was confirmed by immunohistochemical analysis. Interstitial inflammation was the most common non-neoplastic lung lesion, accounting for four percent of all cases (4 percent). In all, 69 lung samples and 6 pleural biopsies were performed using immunohistochemistry. A patient's age ranged from 35 to 80 years old when they had pleural biopsy. Tuberculosis was the most common non-neoplastic lesion, followed by chronic non-specific pleuritis as the second most common. The majority of malignancies (32.4 percent) occurred in people between the ages of 45 and 75. An adenocarcinoma was the most common malignant tumour in the pleurae, followed by non-small cell lung carcinoma in each of the three male patients who had surgery. It was discovered using immunohistochemistry that the pleural malignancy was an outgrowth of the underlying lung cancer.

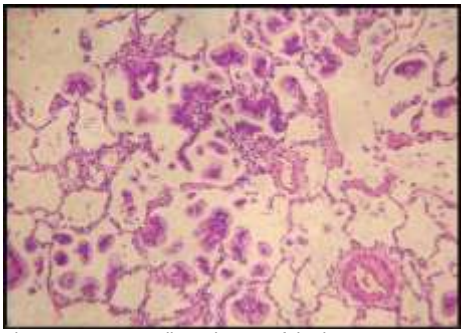

Fig 1: squamous cell carcinoma of the lung

	Lung lesions	Pleural lesions
	SD	SD
Neoplastic		
Adenocarcinoma	56.801±8.548	49.386±12.649
squamous cell carcinoma	1.324±0.143	1.6034±0.280
Non-small cell carcinoma	70.554±10.342	70.586±11.856
Non-small cell carcinoma, SCC	27.675±5.869	28.865±5.145
Small cell carcinoma	23.875±10.337	28.453±10.784
Lymphoblastic lymphoma	16.763±5.879	18.298±7.456
Adenosquamous carcinoma	1.478±1.0349	1.398±1.0289
Metastatic	62.42±5.354	50.732±11.394
Carcinoid tumor	64.264±0.274	4.601±0.476
Synovial sarcoma	56.294±8.765	46.645±9.674
Non-neoplastic	43.675±4.572	32.734±4.294
Tuberculous inflammation	18.256±8.227	17.347±63.436
granulomatous inflammation	12.562±4.371	14.453±5.873
Pneumonia	2.373±1.064	1.47±1.878
Interstitial Inflammation	18.2556.465	15.443±11.843

Table 1 various lesions of lung and pleural biopsy

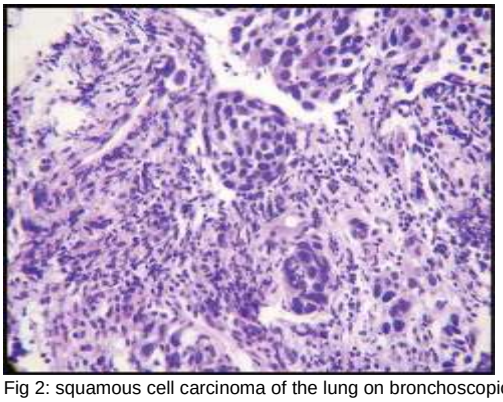

Fig 2: squamous cell carcinoma of the lung on bronchoscopic biopsy

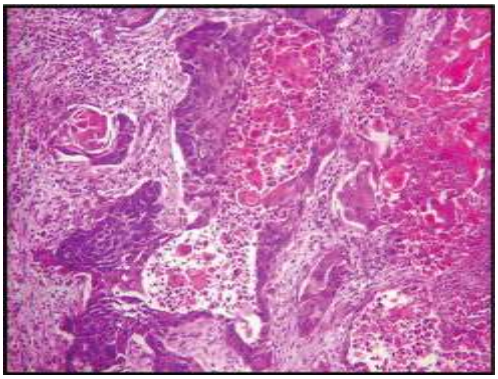

Fig 3: squamous cell carcinoma of the lung

DISCUSSION

Lung and pleural biopsies are used by pathologists to identify and treat a wide range of illnesses. Obtaining a tissue sample is necessary when non-invasive procedures are unable to be used to determine the sickness stage or therapy strategy. Radiology, on the other hand, cannot distinguish between benign and malignant tumours in the body. Lung biopsy can be performed via bronchoscopy, computed tomography (CT), or excision.

The majority of lung tumours need a biopsy of the main tumour prior to therapy. To get adequate tissue samples for molecular analysis of biomarkers, CT-guided percutaneous needle biopsy of the lung is usually done as an outpatient procedure to ensure that sufficient tissue samples are obtained. Breast cancer biopsy can be performed using image-guided techniques in regions of the tumour that are most likely to contain live tumour cells. It is less intrusive than excisional biopsy and is therefore more useful for early diagnosis. The prognosis for lung cancer is getting better. Lung cancer is becoming more prevalent in Pakistan as a result of more information and improved detection procedures. In the treatment of lung cancer, accurate clinical, radiological, and histological diagnosis is essential. The presence or absence of SCLC in a malignant tumour is determined initially (NSCLC). Adenocarcinoma and squamous cell carcinoma are the most frequent types of non-small cell lung cancer. In adenocarcinoma, EGFR, KRAS, and EML4-ALK rearrangements are all targets for therapy. Patients with lung cancer may benefit from targeted therapies. Basaloid, clear cell type, papillary, and small cell nonkeratinizing subtypes are among the histopathological subtypes to be seen. Adenocarcinoma of the lungs caused by non-small cell lung cancer (NSC). It has a papillary pattern with a lepidic pattern. Non-small cell lung malignancies include squamous cell carcinoma, adenocarcinoma, and giant cell carcinomas. Illustration immunohistochemistry provides clinically significant findings in a short period of time and at a low cost. An additional advantage of immunohistochemistry is that it may be used to determine the location of proteins within cells in relation to tumour structure. Pathologists must now classify lung cancer into subgroups and seek for molecular signs, which is a new requirement. Because targetable driver genetic abnormalities are widespread in adenocarcinoma patients, it is important to avoid giving them incorrect medications.

Neuroendocrine tumours are divided into three subtypes: SCLC, LCNEC, and carcinoid (typical/atypical). SCLC is the most common kind of neuroendocrine tumour. Despite the fact that both SCLCs and LCNECs are classified as HGNETs, their clinical characteristics are distinct. Heavy smokers are more likely to get HGNET, an aggressive and lethal variant. Carcinoid tumours are noncancerous and can occur in people who do not smoke. Even when there are clinical differences, neuroendocrine differentiation may be found in many tumours. LCNEC can only be diagnosed if one of the three neuroendocrine markers (CHGA, SYP, or NCAM1) is immunohistochemically expressed in the tumour (CD56). Pleural space exists between the visceral and parietal pleurae, and it is located between the two. Pleural fluid content ranges between 0.1 and 0.2 mL/kg. A pleural effusion is a collection of fluid in the lungs. Acute pleural effusion is the most prevalent symptom of pleural pathology. Pleural effusion can be caused by a variety of conditions such as heart failure, cancer, or pneumonia. When faced with a difficult situation, it is generally advisable to rule out pleural cavity cancer. The treatment is used to treat pleural effusions, thickenings, and tumours that have gone undetected. Pleural biopsy is widespread because of the ease with which it may be performed through percutaneous access. Pleural biopsies indicated the presence of epithelioid cell granuloma development, which was consistent with tuberculous infection. Primary tumours of the pleura and lungs. Squamous cell carcinoma, adenocarcinoma, and small cell carcinoma are the most prevalent types of pleural tumours. Because adenocarcinoma of the lung grows towards the lung's periphery, pleural spread of the underlying lung tumour is typical. Adenocarcinoma of the lung is a kind of cancer that affects the lungs. adenocarcinoma of the pleura was the most prevalent malignant disease in this tissue. Pleural biopsy is a safe and effective technique. It is capable of

detecting both primary and metastatic pleural cancers with high accuracy.

CONCLUSION

In order to correctly diagnose and subtype problematic lesions, pleural and lung biopsy is required. Immunohistochemistry is a vital diagnostic technique that improves the accuracy of such analysis. For diagnostic and therapeutic approach confirmation when non-invasive procedures fail.

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