ORIGINAL ARTICLE

The pattern of association between histopathological vs clinical and radiological findings of lung cancer biopsy in patients of lung cancer

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ABSTRACT

Background: Lung cancer is one of the most deadly tumours known. It is accurately found by many radiographic testing methods occasionally initiated for an unrelated ailment. In light of new histology guided therapeutic modalities and lung cancer genetic categorization, histological characterisation of lung cancer has risen in prominence.
Aim: To link histology findings with clinical and radiographic features.
Methods: This prospective investigation followed 40 patients with suspected lung cancer for a year, looking at clinical, radiological, and histological features. The research covered a clinical history, smoking habits, full physical examination of the respiratory system, chest roentgenogram, computed tomography of the thorax, fiberoptic bronchoscopy, and others.
Results: Patients were aged 56.7 years with 80.2% male and 19.8% female. The most frequent symptom was cough 84.6%. Lesion 85.5% followed by collapse consolidation 35.26% were the most frequent radiological results. Squamous cell carcinoma most typically showed as a hilar mass 54.4%, adenocarcinoma as a peripheral mass 67.4%. Squamous cell carcinoma 48% was the most frequent form, followed by small cell carcinoma 13% and adenocarcinoma 2.98% .
Conclusion: In order to confirm a clinical or radiological diagnosis of lung cancer, endobronchial lung biopsy and histopathology are both extremely necessary tests to do.
Keywords: Lung Cancer, Radiological Patterns, Histopathological Types

INTRODUCTION

Cancer of the lung is the most common type of cancer, accounting for 12% of new cancer cases and 16% of cancer-related deaths throughout the world. Patients with lung cancer were more likely than the general population to have smoked. Cigarette smoking is associated with squamous and small cell carcinomas. Occupational and environmental exposures are responsible for 3–8% of all lung cancer cases. In around 79% of instances, lung cancer manifests itself as symptoms. Lung cancer is discovered in the remaining patients by a variety of radiological and histological techniques. Lymphatic invasion, haematogenous distant metastatic spread, and distant para-neoplastic effects from tumour products or immunological cross-reaction with tumour antigens are some of the less prevalent clinical aspects of lung cancer. With recent advancements in histology-guided treatment and lung cancer genetic classification, there has been a resurgence of interest in the histology of lung cancer. Currently, mutation profiles can be used to identify around 45% of lung adenocarcinomas and more than 27% of squamous cell carcinomas. The therapeutic benefit of molecular classification can be explained by EGFR mutations.

The current study examined the relationship between lung cancer histological patterns and clinicoradiological factors.

MATERIAL AND METHODS

It was necessary to gather a full medical history of the patient's sickness, including the onset and course of the illness, smoking habits, and other risk factors. The patients underwent a thorough examination, which included examination of their respiratory systems. The radiographic evaluation of lung cancer patients was performed. An investigation on the distribution, location, number, and involvement of surrounding structures was carried out After undergoing appropriate tissue processing, slices with a thickness of 4-5 microns were created from all biopsy specimens that were submitted. H&E staining was performed on the sections on a regular basis. The staining methods developed by Bancroft and Stevens were employed (2002). The patterns were derived from the World Health Organization's classification of lung tumours.

RESULTS

Patients were aged 56.7 years with 80.2% male and 19.8% female. The most frequent symptom was cough 84.6%. Lesion 85.5% followed by

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collapse consolidation 35.26% were the most frequent radiological results. Squamous cell carcinoma most typically showed as a hilar mass 54.4%, adenocarcinoma as a peripheral mass 67.4%. Squamous cell carcinoma 48% was the most frequent form, followed by small cell carcinoma 13% and adenocarcinoma 2%. Sixty-four percent of patients had the right lung involved, followed by 49% who had the hilar region involved. Upper zone participation was 19.8%, lower zone participation was 14% and mid zone participation was 3%. The most common radiological finding was a mass lesion 59%, which was followed by collapse 18%. Thirteen percent of the participants had a mixed presentation. Pleural effusion was observed in 19% of patients, with the majority of cases being squamous cell carcinoma. Patients with metastatic disease to the liver, bone, adrenal glands, ipsilateral chest wall, or lungs developed in 8% of cases. All of the patients underwent a CT thorax. A mass lesion was seen in 82% of the patients. Mediastinal lymphadenopathy was seen in 32% of the patients. Individuals with hilar lymphadenopathy accounted for 14% of the population. Patients with metastases accounted for 2% of the total. An endobronchial mass lesion was found in 79% of the patients. Individuals with vocal cord paralysis accounted for 3% of the population. Squamous cell carcinoma was found in 46% of patients, with small cell carcinoma being found in 13% of those who had it. Cancer of the squamous cell type 69% was the most common, followed by small cell carcinoma 22%. When it comes to histological subtypes, the most common ones among smokers were squamous cell carcinoma 70% and small cell carcinoma 20%. It was also the most common pathological diagnosis in non-smokers, according to the data.

Table-1: CECT Findings	
CECT findings	**Std. Deviation (±)**
Hilar mass	23.6±2.12
Right lung mass	18.42±1.33
Collapse/Consolidation	32.42±2.14
Mediastinal LAP	29.01±1.35
Pleural effusion	18.3±3.01
Left lung mass	11.34±2.89
Hilar LAP	9.46±3.42
Metastasis	5.84±4.53

Table-2: Histologic diagnosis	
Histologic diagnosis	**Std. Deviation (±)**
Squamous Cell Ca	25.4±3.34
Small Cell Ca	20.56±2.72
Adenocarcinoma	31.42±3.16
Mod to severe Dysplasia	30.21±1.59
Granulomatous inflammation	19.2±2.99
Non-specific inflammation	12.78±3.01
Inadequate biopsy	8.72±1.62

DISCUSSION

Lung cancer is becoming the most fatal malignancy. Endobronchial lung biopsy is a less invasive lung cancer diagnostic. Lung cancer patients had a mean age of 59.9 years. It primarily affects the elderly. The age range in this research was 39 to 85, similar to Wells GA et al. Females smoke less than males in Pakistan. We discovered that 95.52% of males smoked and 4.482% did not. A WHO report in 1997 connected 92-94% of male lung cancer fatalities to smoking. As in Boffetta P et al. our smoker-to-nonsmoker ratio was 7.8:1. Most of the individuals in this research had a cough. This matches other research. 46.25% of patients felt chest discomfort. This matches other research. 20-21 Hemoptysis was identified in 11-24% of lung cancer patients. Patients in our study were misdiagnosed with tuberculosis and treated elsewhere, which resulted in a delay in diagnosis and presentation. In all, Rawat et al. found that the majority of patients were misdiagnosed as having tuberculosis and were treated elsewhere, resulting in a 4-6 month treatment delay. According to Boffetta P et al., 23.4% of lung cancer patients were mistakenly diagnosed with tuberculosis. Several investigations have shown that the right lung is involved, with the upper lobe being the most prevalent location of involvement. This was also demonstrated in this research. This kind of cancer is characterised by the presence of a central mass. The majority of squamous cell carcinomas were characterised by hilar bulk. The same was discovered by Gupta et al. Patients with squamous cell carcinoma had a Central Lesion in 75% of their cases. Small cell lung carcinoma was the primary tumour in this investigation 41.7%. Our investigation is equivalent. Boffetta P and colleagues discovered a common central lesion.

Peripheral tumours or pleural effusions are used to confirm the diagnosis. Adenocarcinoma was found in 5.45% of lung cancer patients, with the majority of cases occurring in the upper zone (66%) and occasionally associated with pleural effusion. . Moher D et al. discovered a malignant pleural effusion or a peripheral tumour in one of their patients. This might be due to the fact that female smokers are uncommon in India. Patients with squamous cell carcinoma accounted for 21.8% of all cases. 9.1% of patients had metastases in the liver, bone, adrenal glands, ipsilateral chest wall, and lungs, among other organs. Using CT scans of the chest and upper abdomen, lung cancer has already been detected and staged. The majority of them had a hilar mass 37.75%. A right lung mass was discovered in 36.25% of the population. According to Rawat et al., 46.13% of the patients had mass lesion and 40.89% had collapse-consolidation. On CT scans, 28 people were found to have mediastinal lymphadenopathy. In one study, 34% of participants developed mediastinal lymphadenopathy, which is a kind of cancer. In our investigation, endobronchial mass lesions were found in 85% of the patients, and vocal cord paralysis was found in 5% of the patients. smokers were more likely to develop squamous cell carcinoma 24.48%. Nonsmokers had a higher incidence of squamous cell carcinoma. According to a similar study conducted by Sheikh et al., squamous cell carcinoma was the most common histological subtype among smokers 22.9%. The pathophysiology of lung cancer in the western world is evolving. Adenocarcinoma is the most prevalent histological type seen in female cancer patients. Among the several subtypes of carcinoma, squamous cell carcinoma is the most frequent in India. The most prevalent histological subtype was squamous cell carcinoma (which accounted for 50% of all cases), followed by small cell carcinoma 20%. people 3.75% were diagnosed with lung cancer.

CONCLUSION

As a result, squamous cell carcinoma is still the most common histological subtype in the United States. For the vast majority of patients, smoking was the most significant risk factor. Ongoing needs in this region include early detection and treatment of lung cancer, as well as public education about the dangers of smoking and how to avoid the disease.

Conflict of interest: Nil

REFERENCES

1. European Commission. Attitudes of Europeans Towards Tobacco and Electronic Cigarettes. 2015. http://ec. europa.eu/public_opinion/archives/ebs/ ebs_429_en.pdf. Accessed June 13, 2016.
2. Royal College of Physicians. Passive Smoking and Children. A Report by the Tobacco Advisory Group. London, UK: Royal College of Physicians; 2010. 3. World Health Organization. Framework Convention on Tobacco Control (FCTC). 2014.
3. European Respiratory Society. SmokeHaz: a scientific review of the health hazards of smoking. http://www.europeanlung.org/ en/projects-and-research/projects/ smokehaz/home. Accessed April 1, 2013.
4. Wells GA, Shea B, O'Connell D, et al. The Newcastle-Ottawa scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses. http://www. ohri.ca/programs/clinical_epidemiology/ oxford.asp. Accessed February 27, 2013.
5. Shea B, Grimshaw J, Wells G, et al. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. BMC Med Res Methodol. 2007;7:10.
6. Higgins J, Thompson S. Quantifying heterogeneity in a meta-analysis. Stat Med. 2002;21(11):1539-1558.
7. Stroup D, Berlin J, Morton S, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) group. JAMA. 2000;283(15):2008-2012.
8. Moher D, Liberati A, Telzlaff J, Altman D, The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-analyses: the PRISMA statement. PLoS Med. 2009;6(6):e1000097.
9. Al-Delaimy WK, Willett WC. Toenail nicotine level as a novel biomarker for lung cancer risk. Am J Epidemiol. 2011;173(7):822-828.
10. Bae J, Gwack J, Park SK, Shin HR, Chang SH, Yoo KY. Cigarette smoking, alcohol consumption, tuberculosis and risk of lung cancer: the Korean multi-center cancer cohort study [in Korean] J Prev Medic Public Health. 2007;40(4):321-328.
11. Bae JM, Lee MS, Shin MH, Kim DH, Li ZM, Ahn YO. Cigarette smoking and risk of lung cancer in Korean men: the Seoul Male Cancer Cohort Study. J Korean Med Sci. 2007;22(3):508-512.
12. Blot WJ, Cohen SS, Aldrich M, McLaughlin JK, Hargreaves MK, Signorello LB. Lung cancer risk among smokers of menthol cigarettes. Am J Epidemiol. 2011;173(suppl 11):S85.
13. Boffetta P, Clark S, Shen M, Gislefoss R, Peto R, Andersen A. Serum cotinine level as predictor of lung cancer risk. Cancer Epidemiol Biomarkers Prev. 2006;15(6): 1184-1188.
14. Chao C, Li Q, Zhang F, White E. Alcohol consumption and risk of lung cancer in the VITamins and lifestyle study. Nutr Cancer. 2011;63(6):880-888.
15. Chyou PH, Nomura A, Stemmermann G, Kato I. Lung cancer: A prospective study of smoking, occupational, and nutrient intake. Arch Environ Health. 1993;48(2):69-72.
16. Ellard GA, de Waard F, Kemmeren JM. Urinary nicotine metabolite excretion and lung cancer risk in a female cohort. Br J Cancer. 1995;72(3):788-791.
17. Elliott AM, Hannaford PC. Use of exogenous hormones by women and lung cancer: evidence from the Royal College of General Practitioners' Oral Contraception Study. Contraception. 2006;73(4):331-335.
18. Elgeland A, Haldorsen T, Andersen A, Treti S. The impact of smoking habits on lung cancer risk: 28 years observation of 26,000 Norwegian men and women. Cancer Causes Control. 1996;7(3): 366-376.
19. Eriksson JG, Thornburg KL, Osmond C, Kajantie E, Barker DJ. The prenatal origins of lung cancer. I. The fetus. Am J Hum Biol. 2010;22(4):508-511.
20. Freedman ND, Leitzmann MF, Hollenbeck AR, Schatzkin A, Abnet CC. Cigarette smoking and subsequent risk of lung cancer in men and women: analysis of a prospective cohort study. Lancet Oncol. 2008;9(7):649-656.
21. Hayes JH, Anderson KE, Folsom AR. Association between nonsteroidal antiinflammatory drug use and the incidence of lung cancer in the Iowa women's health study. Cancer Epidemiol Biomarkers Prev. 2006;15(11):2226-2231.
22. Islam SS, Schottenfeld D. Declining FEV1 and chronic productive cough in cigarette smokers: a 25-year prospective study of lung cancer incidence in Tecumseh, Michigan. Cancer Epidemiol Biomarkers Prev. 1994;3(4):289-298.
23. Jee SH, Samet JM, Ohrr H, Kim JH, Kim IS. Smoking and cancer risk in Korean men and women. Cancer Causes Control. 2004;15(4):341-348.
24. Kabat GC, Kim M, Hunt JR, Chlebowski RT, Rohan TE. Body mass index and waist circumference in relation to lung cancer risk in the women's health initiative. Am J Epidemiol. 2008;168(2):158-169.