Profile of Lung Cancer in Two Niger Delta States of Nigeria: An Evaluation of 43 Cases

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Abstract

Background: The data on the epidemiology of lung cancer in Niger delta states is scarce. Therefore, this study aims to determine the epidemiological profile of lung cancer in two Niger Delta states in Nigeria.
Methodology: This was a retrospective analysis of all patients managed for histologically diagnosed lung cancer from Jan 2014 to Dec 2019 at two tertiary hospitals in Niger Delta states of Nigeria. The demographics, diagnoses, results of investigations, and outcomes were analysed using descriptive statistics.
Results: Forty-three patients were reviewed with a male-to-female ratio of 1.5:1 and an age range between 13-89 years with a mean of 53.5 ± 17.0 years. The following number of patients; 1(2.3%), 26(60.5%), 4 (9.3%) and 12(27.9%) were distributed according into the following age groups ;< 20, 20-59, 60-64 and >65 respectively. Eleven (25.6%) patients were smokers. The commonest symptoms were dyspnoea in 39(90.7%), cough in 35(81.4%), weight loss in 29(67.4%), chest pain in 28(65.1%), and change in voice (hoarseness of voice) in 8(18.6%); while the signs were respiratory distress in 33(76.7%), digital clubbing in 8(18.6%), superior vena cava syndrome in 2(4.7%).The left lung was commonly affected in 24(55.8%) patients, and the left upper lobe was the most common in 21 (20.2%), while the right upper lobe was the least in 13(12.6%) patients. The histological types were Adenocarcinoma in 26(60.5%), squamous cell carcinoma in 15(34.9%) patients, and small cell carcinoma in 2(4.7%) patients. Fifteen (34.9%) patients had elevated platelets. The modalities of pathologic diagnoses were: Mini-Thoracotomy10 (23.3%), Tru-cut biopsy 28 (65.1%), and Bronchoscopy 5 (11.6%).The mortality rate after six months following lung cancer diagnosis was 7(16.2%).
Conclusion: In our environment, lung cancer may have a bimodal distribution, peaking in the middle age group and elderly patients who were mainly non-smokers. Elevation of platelets was observed in a significant number of patients.
Keywords: Epidemiology; Lung Cancer; Pollutants; Niger-Delta.

Introduction

Lung cancer morbidity and mortality are progressively becoming a major public health care problem [1], especially regarding the aetiology and preventive measures. The vast majority of lung cancer is caused by smoking tobacco, but the danger from environmental pollutants, including air pollution, has been reported[2]. Overwhelming evidence shows that particle pollution in the outdoor air that can be inhaled, such as particulate matter from vehicle exhaust, coal-fired power plants, industrial sources, and the product of petroleum products, can cause lung cancer [3-5]. It is

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also noteworthy to state that these products are abundant in the Niger delta area, especially with the proliferation of many illegal refineries that equally lead to the destruction of vegetation the in this area [5]. From the Globo can source 2020, lung cancer was ranked 2nd, after breast cancer, and ranked 1st as the cause of cancer death (18%) for the year 2020for both sexes and all ages [6,7].

Lung Cancer is common in males, but the sudden rise in females may result from increased smoking among females and probably the effect of environmental pollutants [4,5,8-13]. The impact of environmental pollutants on lung cancer incidence may also account for the increased incidence in older people in the same area [12,14]. Despite this suspicion of the effect of environmental pollutants on the rising case of lung cancer, research output on this subject from the Niger delta of Nigeria is still scarce.

This study aims to determine the epidemiological profile of lung cancer in two Niger Delta states of Nigeria.

Methodology
This was a retrospective survey of all patients managed for lung cancer from Jan 2014 to Dec 2019 at the University of Port Harcourt and Federal Medical Centre Owerri, located in Rivers state and Imo State, respectively, in Nigeria. The demographics, diagnoses, results of investigations, and outcomes were analysed through descriptive statistics. All patients whose hospital records were obtained and who had histological diagnoses of lung cancer were included. The information on the patient biodata, clinical features, investigations, treatment, and outcomes were extracted from the records and put in an excel spreadsheet. To aid confidentiality, the names of the patients were not added to the excel spreadsheet. The Chest CT scan reports for the patient were also reviewed in other to identify the lobe(s) of the lung affected. This study was limited to histologically diagnosed lung cancer.

Results
Socio-demographics
There were 43 patients with a male-to-female ratio of 1.53: an age range between 13-89 years with a mean of 53.5+17.0 years. The following number of Patients 1 (2.3%), 26 (60.5%), 4 (9.3%), and 12 (27.9%) were distributed to the following age groups<20, 20-59, 60-64, and >65, respectively [15].

Eleven (25.6%) of the patients were smokers.

Clinical Presentation
The commonest symptoms were dyspnoea in 39(90.7%), cough in 35(81.4%), weight loss in 29 (67.4%), chest pain in 28(65.1%), and change in voice (hoarseness of voice) in 8(18.6%). The signs observed were respiratory distress in 33(76.7%), digital clubbing in 8(18.6%), and superior vena cava syndrome in 2(4.7%). The left lung was commonly affected in 24(55.8%) patients, and when the six different lobes were considered; the left upper lobe was the commonest lobe affected in 21(20.2%), while the right upper lobe was the least affected in 13 (12.6%) patients. There was elevated platelet count in 15(34.9%) patients.

Histopathological Type
The histological types were Adenocarcinoma in 26(60.5%), squamous cell carcinoma in 15 (34.9%) patients, and small cell carcinoma in 2(4.7%) patients. The diagnosis of lung cancer was established based on clinical criteria and confirmed by pathological reports from mini-Thoracotomy and Biopsy 10(23.3%), Tru - cut biopsy 28(65.1%) [16] , Bronchoscopy and Biopsy 5(11.6%),and in 18 (41.9%) who presented with pleural effusion with pleural aspirate for cytology in 15 (34.9%) diagnosed as Malignant Cells. The mortality within six months following diagnosis was 7(16.2%).

Discussion
From the Nigerian global cancer observatory fact sheet, lung cancer ranked 14th and 12th in incidence and mortality, respectively, among all cancers on the site [17]. In Ghana, lung cancer was the 3rd commonest cause of cancer in males [18]. The statistics for UK and US were the same as that of Ghana in terms of the most common cancer, but these statistics were for both genders [19].

A review of the different studies in Nigeria showed the following: In Ibadan (South West, Nigeria), there were 142 cases diagnosed with lung cancer during 30 years, giving an incidence of 5 lung cancer cases per year and a male: female ratio of 1.7:1[20];

while in Enugu (South East), there were 51new cases diagnosed during a two and half-year period, giving a yearly incidence of 20 lung cancer cases and a male: female ratio of 2.4:1[21], and finally, in Ilorin (North Central), for the 71 cases of primary lung cancer diagnosed during eight years, giving an incidence of 9 lung cancer cases per year and a male to female ratio of 2:1[22]. This study in Port Harcourt and Owerri (Niger Delta) showed a total of 43 lung cancer cases for six years, giving a rate of lung cancer of 7 or 8 cases per year and a male-to-female ratio of 1.5. Apart from the South East, where it was reported that there was a total of 20 new lung cancer cases every year, the other two regions gave a similar figure of between 5 to 9 cases per year. However, the findings from this study may underestimate the real burden due to a lack of the capacity to make a diagnosis and the late presentation of most patients [1].

Furthermore, the report by Ogubiyi et al. in 1995[20], 17 years before the report of Ezemba *et al*[21] showed an annual rate of 5 lung cancer cases per year to 20 cases per year. Though our report of 7 cases per year approximates the findings from Ogubiyi et al lower in number than that reported by Ezemba et al in the South East [21] Ezemba's study targeted patients attending UNTH from 5 states, over time, more facilities for care have developed in other areas, giving options to spread outpatients load, while Ogubiyi study was a 30 retrospective study and also focused on autopsies all these may explain the differences observed. This low report of cases may be due to the problem with record-keeping, the retrospective nature of the survey coupled with a lack of autopsy diagnosis, and geographic and environmental factors [1,20,23]. Thus, with adequate record-keeping, the correct picture of lung cancer in our environment and the Nation, in general, may be revealed.

A study done in Hungary showed that the incidence rate peaked in the younger age group compared to developed countries. The reason was that it was most likely due to higher smoking prevalence in the study cohorts. In contrast, another study from Spain reported a decrease in the absolute number of new cases in men under the age of 70 and an increase in women aged 60 years or older. Still, in both sexes, the incident cases increased by 16% for patients over 70 years [24-25].Thus, increased lung cancer incidence in old and elderly patients can be attributed to the risk of cigarette smoking. In this study, two peaks were observed: one peak at the age group of 20-59 years and another for those greater than 65 years. Thus, giving a bimodal presentation pattern for Lung cancer in our setting. The early or first peak of lung cancer in the environment may be due to environmental risk factors occasioned by pollutants from petroleum-related activities. The second peak for those over 65 years may be due to the risk factors, mainly from cigarette smoking, as previously stated by previous studies [20-26].

The difference in the number between males and females in the previous studies in the country [20-22] was observed to be wide. However, in our current review, the difference appeared to have reduced to 1.53 to 1, showing an increasing number of females with lung cancer. This is worrisome, especially when predicated upon the fact that a greater percentage of the patients denied a history of smoking cigarettes. The implication is that some environmental factors may be responsible for the relative increase in lung cancer incidence in females in our environment, especially when we consider the increase in refineries and their activities in the area, as was previously reported and the increase in second-hand smoking among females [5,23]. The other finding from this study was a relative increase in female sex prevalence for lung cancer and a peak incidence in the younger age groups who are mainly non-smokers.

Most of the lung cancer statistics were on small and Non-small cell cancer; about 84% are NSCLC, and 13% of all lung cancers are [26,27]. All the histologic types of lung cancer were significantly associated with cigarette smoking, but the association was reported to be stronger with squamous cell carcinoma than with adenocarcinoma [28-29]. Thus, when Ogunbiyi *et al* [20] reported a higher incidence of smokers, the commonest histological type was squamous cell carcinoma, and when there was a decrease in the number of smokers to 42%[19,20] and even less with our series of 25%, the histological type was noted was Adenocarcinoma. This supports the previous reports that squamous cell carcinoma occurs more in cigarette smokers [20-29].

Lung cancer was reported to be common in the upper lobes for both males and females [29]. However, in our series, the left lung was commonly affected in patients. When the six different lobes were considered, the left upper lobe was the commonest lobe affected, while the right upper lobe was the least affected in patients. The upper lobes of the lungs are more aerated than the lower portion; thus, whatever pollutant is inhaled will affect the upper lobes more and in greater concentration. Also, lung cancer occurred more in the upper lobes and in the left lung which is smaller than the right lung may give credence to the fact that the increase in environmental pollutants from hydrocarbon-related activities in the Niger Delta is responsible for the increase in lung cancer in the area.

Conclusion

Lung cancer in our environment may have a bimodal distribution, peaking in the middle age group and elderly patients, who are mainly non-smokers. It occurred more in the upper lobes and left lung than the other lobes and right lung, respectively, with a relative increase in females. In addition, there was a significant number of patients with elevated platelet counts, and environmental risk factors beyond smoking may be a risk factor.

However, it is important to state that for the level of evidence to be higher and impact more in clinical and public health practice, a case-controlled study is desirable to explore these findings, and this calls for further research to elucidate other possible aetiologies about the presence of dangerous carcinogenic pollutants and fumes in the environment.

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