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RETROSPECTIVE EVALUATION OF BURDEN OF LUNG CANCER IN DIFFERENT ETHNIC GROUPS AND GENDERS AT KARACHI, PAKISTAN

Sheikh Abdul Khaliq[1]*, Syed Baqir S. Naqvi[1], Anab Fatima[2], Maria Siddiqui[1]

[1]Faculty of Pharmacy, Hamdard University, Karachi, Pakistan.
[2]Dow College of Pharmacy, Dow University of Health Sciences, Karachi, Pakistan
*Corresponding Author: drsheikh1974@gmail.com

ABSTRACT

Lung cancer is a third leading cancer in Pakistan with high mortality rate. To determine incidences in the population of Karachi, Pakistan, a retrospective study in different ethnic group was conducted from January 2011 to December 2015 to determine incidences of lung cancer in last five years registered in oncology wards of major hospitals of Karachi. Registered patients of lung cancer with confirmed diagnosis cytologically and/or histologically was included in the study. Secondary data from retrospective patient's charts and files have been gathered. Most of the cases were from city of Karachi, Interior Sindh and Balochistan provinces. Minimum sample size of study was 147, however, evaluation was done on 169 patients. In addition to type of cancer, ethnicity, gender and age were also recorded. SPSS 20 software was employed for analysis including mean age, standard deviation, standard error and co-efficient of variation. Number of cases and incidences of lung cancer in different ethnic groups were found to be; Sindhi male 51 (38%), Sindhi female 12 (34%), Urdu speaking male 32(24%), Urdu speaking female 09 (26%), Balochi male 10 (07%), Balochi female 04 (11%), Pukhtoon male 09 (07%), Pukhtoon female 03 (09%), Punjabi male 25 (19%), Punjabi female 05 (14%), Siraikis male 03 (02%) minorities and other males 04 (03%), minorities and other females 02 (06%). Highest incidences are observed in Sindhi and Urdu speaking population of Sindh province, especially in male. Active, passive smoking, air-pollution and occupational exposure could be reason of high number of incidences in major ethnic groups of Karachi, therefore screening parameters are of paramount importance to reduce the burden of disease.

Keywords: lung cancer, incidences, ethnic groups, smoking, screening.

INTRODUCTION

Lung cancer is the type of carcinomas, that causes tumors of different sizes in epithelia of trachea or bronchi of lungs [1]. Lung cancers are categorized in small cell lung cancer, non-small cell lung cancer, clinically

Table 1: Distribution of lung cancer among male gender

Ethnic Origin of Patient	No. of cases (N)& Incidences of Lung Cancer (%)	Mean age (Years)	SD Standard Deviation	SEM Standard Error of mean	Coefficient of Variance %
Sindh	51 (38%)				
Urdu Speaking	32(24%)				
Balochistan	10 (07%)				
Khyber Pukhtunkhwa	09 (07%)				
Punjab	25 (19%)	56.95	± 9.77	± 0.84	17.17%
Sariki	03 (02%)				
Minorities	04 (03%)				
Total Cases	**134**				

non-small cell cancers are further categorized in three different types including; Squamous cell carcinoma, adenocarcinoma and large cell carcinomas [2]. Histologically lung cancers have strong relationship with smoking especially small cell lung cancer and squamous cell carcinoma [3]. In initial phase of lung cancer signs or symptoms does not occur, but many people sometimes initially have these symptoms including unrelenting cough, sputum with blood, apnea, fatigue, loss of weight, pain in inhalation and exhalation [4].

In Pakistan, prevalence and death rate due to lung cancer is growing rapidly like rest of the world, where it is very widespread malignancy [5]. Unfortunately, very limited data exists in Pakistani population which recognizes determinants of lung cancer [6]. According to research, lung cancer becomes 4th leading cause of death in cancers [7]. In Pakistan its prevalence become 15%, in which adenocarcinoma constitutes 40%-45% and epidermal growth factor receptor,

tyrosine kinase has been reported the main cause of adenocarcinoma mutation [8]. The retrospective study has been done on 255 males and 45 females in Lahore which has reported that lung carcinoma is more in male and its prevalence is increasing in young ages [9]. The study further illustrates that nodal status, mucin production by tumor and increased angiogenesis are the predictors of poor survival in adenocarcinoma patients [10]. In addition, failure of initial treatment was associated with markedly increased costs, that is why new strategies are needed to reduce hospitalization of cancer patients or prevent treatment failure and to decrease the burden of cost [11].

Pakistan is a state of diversified culture [12]. There is no existing data either for prevalence or incidences of lung cancers in different ethnic groups of Pakistan. Therefore, objective of current cross-sectional study was to collect data about current incidences of lung cancer in different ethnic groups living in Karachi, Pakistan.

MATERIALS AND METHODS

The retrospective cross-sectional study was conducted in Karachi Pakistan. Karachi is also called mini-Pakistan because all Pakistani ethnic groups live in this city [13]. The secondary data have been collected from six different state owned and private hospitals where cancer cases are reported. Duration of study is five years from January 2011 – December 2015. Minimum sample size of study was 147 patients and determine by precision analysis technique [14]. More than 180 patients histopathological diagnosed with lung cancer were screened, among which 169 patients included in analysis, children ≤ 12 years, incomplete data in patient's file, diagnosis not yet confirmed, lack of patient's objective data and preliminary diagnosis were exclusion criteria, which fits on 11 patients.

Table 2: Distribution of lung cancer among female gender

Ethnic Origin of Patient	No. of cases (N)& Incidences of Lung Cancer (%)	Mean age (Years)	SD Standard Deviation	SEM Standard Error of mean	Coefficient of Variance
Sindh	12 (34%)				
Urdu Speaking	09 (26%)				
Balochistan	04 (11%)				
Khyber Pukhtunkhwa	03 (09%)				
Punjab	05 (14%)	55.97	± 12.29	± 2.07	21.96%
Sariki	00 (00%)				
Minorities	02 (06%)				
Total Cases	35				

Most of the registered cases of lung cancer were included in study from public hospitals. Patient's files, case sheets and charts were gathered from medical record rooms of hospitals. Collected information was organized on Microsoft Excel Sheet. Demography of the patients was recorded that included age, gender, ethnic group, occupation, cancer type, date of diagnosis and the pharmacotherapy/chemotherapy received. Mean age, standard deviation, standard error and co-efficient of variation was determined by employing SPSS-20 software.

RESULTS

Distribution of lung cancer ethnic origin wise and the mean age of diagnosis of lung cancer in male is 56.95 years, SD± 9.77, SE± 0.84 and Coefficient of Variance 17.17% (Table 1).

Similarly, distribution of lung cancer ethnic origin wise and the mean age in female 55.97 years, SD± 12.29, SE± 2.07 and Coefficient of Variance 21.96% (Table 2).

DISCUSSION

It is a bleak reality that incidences of lung cancer are increasing in Karachi, Pakistan included in study from public hospitals.

Patient's files, case sheets and charts were gathered from medical record room of hospitals. Collected information was organized on Microsoft Excel Sheet. Demography of the patients was recorded that included age, gender, ethnic group, occupation, cancer type, date of diagnoses and the pharmacotherapy/chemotherapy received. Mean age, standard deviation, standard error and co-efficient of variation was determined by employing SPSS-20 software.

Current study focuses on the recent trend of lung cancer to compare with past published literature. Findings of present study indicates that mean age of diagnoses of lung cancer is 56.96±09.77 years in male and 55.97±12.29 years in female, while another study indicates the peak age of incidences of lung cancer among Pakistani male is 63 years and among Pakistani female 68.5 years [5]. In general lung cancer is considered as cancer of old age, as most of the cases diagnosed are 65 years or older, globally mean age of diagnosis is 70 years [15]. It seems that mean age of diagnosis is lower in Pakistani population, which needs careful attention of healthcare policy makers. If such situation continues, Pakistan will have huge burden of lung cancer.

Mortality rate from lung cancer is increased by 2.2% yearly from 1973 to 1988 in US population [16]. According to GLOBOCON, lung cancer is 3rd leading cancer in Pakistan with 6800 new cases and 6013 deaths in year 2012 [5]. Microanalysis of study reveals that most lung cancer incidences occur in Sindhi male and female. The second highest incidences are observed in Urdu speaking population mainly living in big cities of Sindh province. Its probable reason may be cigarette smoking in males and smoky coal in the females, as the low socioeconomic sindhis cook their foods on coal. 90% cases of lung carcinoma have strong correlation with smoking [17]. Another researcher also proposed several reasons that include smoking pattern, air-pollution and occupational exposure of toxins [18]. Passive smoking and occupational exposure can also play role in lung cancer [19]. However, use of tobacco is rising in Pakistan and according to WHO report of 2011, 32.4% male and 5.7% females are tobacco users [20]. Alarming situation is that trend of smoking is also rising in boys and girls and currently 9.9% boys and 1% girls are smokers [17].

In Europe, 2% deaths have been reported due to lung cancer in smokers and non- smokers exposed to radon gas, which is why a cause-and-effect relationship can be established with radon gas [21]. Similarly, lung cancer mortality in Chinese female is very high due to indoor burning of smoky coal [22]. On the other hand, Lung cancer in the never smokers affect women disproportionately more often than men and due to this reason, some researchers proposed that exposure to fumes during cooking, heavy metals, asbestos, radon gas, tobacco smoke in environment, genetic propensity, and HPV (Human Papilloma Virus) infections could be reasons of such devastating outcomes.

As far as the prevention strategies are concerned, United states Preventive Services Task Force (USPSTF) recommends yearly screening for lung cancer with low-dose computed tomography in adults aged 55 to 80 years who are smokers **[23]**. There should be programs in society for the discouragement of smoking **[24]**. Pakistani health policy makers should act and form preventive strategies for lung cancer by awareness programs.

CONCLUSION

Incidences of lung cancer are increasing and becoming threat in Pakistani population, therefore screening parameters are of paramount importance to reduce the number of cases. Lung cancer is almost present in all ethnic groups of Pakistan while having higher prevalence in Sindhi and Urdu speaking ethnic groups, especially in males.

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