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ORIGINAL ARTICLE

LUNG CARCINOMA: ITS PROFILE AND CHANGING TRENDS

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Background: Lung Carcinoma is the leading causes of morbidity and mortality worldwide with an incidence of 1.3 million cases per year. This study was undertaken to determine prevalence of various histological types of lung carcinoma and to analyse their changing trends with time.

Methods: This is a retrospective analytical study. A total of 330 cases of lung carcinoma were analysed from 2003 to 2008. Cases from Khyber Pakhtunkhwa and Federally Administered Tribal Area (FATA) were included in this study. Furthermore, only cases of lung carcinoma were considered while other malignancies were excluded. **Results:** Squamous Cell carcinoma was found in 42.7% of cases. Overall male to female ratio was 2.67:1. Prevalence of Squamous Cell carcinoma increased from 32% to 57.9% while that of Small Cell carcinoma increased from 12% to 17.1%. Unspecified type showed a decrease from 36% to 5.3%. Increase in the prevalence of Squamous Cell carcinoma was found in both males and females while change in the prevalence of Small Cell carcinoma was found only in males. **Conclusion:** Squamous Cell carcinoma was the most prevalent variant of lung carcinoma in our region, followed by Adenocarcinoma. Male to female ratio across different histological patterns did not show significant variation. Increase in the prevalence of Squamous Cell carcinoma was statistically significant in both males and females while in case of Small Cell carcinoma change in its prevalence was also significant in males.

Keywords: Lung Carcinoma, Squamous Cell carcinoma, Adenocarcinoma, prevalence, profile

INTRODUCTION

Lung Carcinoma is one of the most dreaded diseases known to mankind. It is one of the leading causes of morbidity and mortality in both males and females worldwide.¹ Besides being the number one cause of cancer related deaths in developed countries, it is also a major cause of mortality in developing countries. Relative prevalence of various histological patterns of lung carcinoma has changed over a period of time and this may be attributed to changes in various risk factors like smoking.² However the prognosis is still poor as most of them have usually metastasized distantly before being diagnosed and therefore almost all types have a poor 5 year survival rate.

In our region very little data is available regarding lung carcinoma and its various histological types. Composed of different ethnicities the population of this region faces many health problems which range from minor ailments to chronic non communicable diseases most of which are of Public Health importance. Provision of proper healthcare is insufficient at different levels ranging from primary to tertiary level. In addition, there is lack of an efficient referral system. As a result the population turns to Complementary and Alternative medicine (CAM), which further delays the visit, to the specialist and contributes to late diagnosis and poor prognosis. Several major risk factors exist in our society including cigarette smoking, tobacco chewing and occupational

which contributes to lung carcinoma.

This study was conducted to see relative prevalence of various histological patterns of lung carcinoma in our region and to highlight their changing trends with time. In addition, the gender wise distribution was compared with available data.

MATERIAL AND METHODS

This study is a retrospective analytical study. Data was taken from medical records of Institute of Radiotherapy and Nuclear Medicine (IRNUM) which represents population from Khyber Pakhtunkhwa, Federally Administered Tribal Areas (FATA), Northern Punjab and adjacent regions of Afghanistan. Data was analysed over a period of 2003–2008. Patients from Khyber Pakhtunkhwa and FATA were included in the study while those from other areas like Northern Punjab and Afghanistan were excluded. The diagnoses were based on histological findings; patients with lung carcinomas were included and those with lung malignancies other than carcinomas were excluded. Gender was also included as a perimeter for the study.

Lung carcinoma was further classified as Squamous Cell Carcinoma, Adenocarcinoma, Unspecified type, Small (Oat) Cell Carcinoma, Large Cell Carcinoma, Papillary Carcinoma, and Carcinoid tumours. Z-Test of hypothesis testing and χ^2 were utilised for statistical analysis. All results were considered significant when $p < 0.05$.

RESULTS

A total of 330 cases of lung carcinoma were analysed. Overall, the patient population ranged from middle to old age. Out of a total of 330 cases, Squamous Cell Carcinoma was found to be the most prevalent with 141 cases (42.7%) followed by Adenocarcinoma (20.3%), Unspecified type (19.1%), Small (Oat) Cell carcinoma (16.4%), Large cell carcinoma (0.9%), Carcinoid tumour (0.3%) and Papillary carcinoma (0.3%), (Figure-1). There were 240 males and 90 females in total with an overall male to female ratio of 2.67:1. This ratio was highest in patients with Squamous Cell carcinoma (3.7:1) followed by Small Cell (2.86:1), Unspecified type (2.5:1), Large Cell (2:1) and Adenocarcinoma (1.58:1). However this variation in male to female ratio across different histological patterns did not prove to be statistically significant ($p=0.1165$). (Figure-1)

During the study period, prevalence of Squamous Cell Carcinoma increased from 32–57.9% ($p=0.0008$). Likewise Small Cell carcinoma showed an increase from 12–17.1% ($p=0.0293$). In contrast, Unspecified type showed a decrease from 36–5.3% ($p=0.0220$). Other histological patterns although showed a change in their relative prevalence, these changes were not considered statistically significant (Table-1). Overall Squamous Cell carcinoma was found to be most prevalent in both males (46.3%) and females (33.3%); however both males and females showed a statistically significant increase in the prevalence of Squamous Cell carcinoma across study period (males: $p=0.0063$, females: $p=0.0264$). Likewise changes in prevalence of Small Cell carcinoma in males was also statistically significant ($p=0.0354$). Changes in prevalence of other histological patterns were not significant in both males and females. (Table-2)

Figure-1: Male to female ratio across various histological patterns of lung carcinomas Total Cases (n=330)

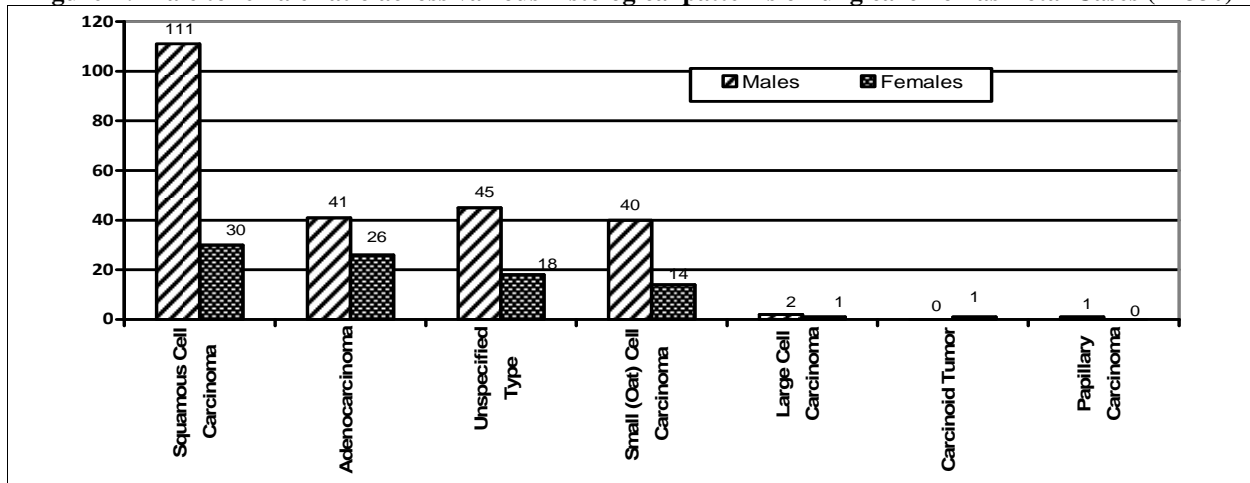


Table-1: Distribution of various histological patterns of lung carcinoma across the study period [n(%)]

	2003–4	2004–5	2005–6	2006–7	2007–8	Total Cases	<i>p</i>
Squamous Cell	16 (32)	22 (33.3)	23 (31.5)	36 (55.4)	44 (57.9)	141	0.0008*
Adenocarcinoma	9 (18)	14 (21.2)	15 (20.5)	14 (21.5)	15 (19.7)	67	0.2801
Unspecified	18 (36)	21 (31.8)	15 (20.5)	5 (7.7)	4 (5.3)	63	0.0220*
Oat (Small) Cell	6 (12)	8 (12.1)	19 (26)	8 (12.3)	13 (17.1)	54	0.0293*
Large Cell	1 (2)	0	0	2 (3.1)	0	3	0.8026
Carcinoid Tumors	0	0	1 (1.4)	0	0	1	0.9331
Papillary Carcinoma	0	1 (1.5)	0	0	0	1	0.9307
Total Cases (N)	50	66	73	65	76	330	

Table-2: Gender-wise distribution of histological patterns of lung carcinoma across the study period [n(%)]

		2003–4	2004–5	2005–6	2006–7	2007–8	Total Cases	<i>p</i>
Squamous Cell Carcinoma	Males	15 (38.5)	18 (36.7)	18 (36.7)	24 (55.8)	36 (60)	111	0.0008*
	Females	1 (9)	4 (23.5)	5 (20.8)	12 (54.5)	8 (50)	30	0.2801
Unspecified Carcinoma	Males	12 (31)	16 (32.7)	9 (18.4)	4 (9.3)	4 (6.7)	45	0.0220*
	Females	6 (55)	5 (29.4)	6 (25)	1 (4.5)	0	18	0.0293*
Small (Oat) Cell Carcinoma	Males	6 (15.4)	7 (14.3)	14 (28.6)	4 (9.3)	9 (15)	40	0.8026
	Females	0	1 (5.9)	5 (20.8)	4 (18.2)	4 (25)	14	0.9331
Other Types		10	15	16	16	15	72	
Total Cases (N)	Males	39	49	49	43	60	240	
	Females	11	17	24	22	16	90	

DISCUSSION

Lung cancer is reported to have the highest incidence worldwide of approximately 1.3 million new cases annually.³ In USA alone its incidence has increased significantly over past 50 years making it the most common cancer in the United States.⁴ The ratio of Lung carcinoma in males and females is reported to be different in different parts of the world. In Europe it has been described as 21% of all cancers in males and 29% in females.⁵ However another study quotes lung cancer as 6 times more frequent in men as in women.⁶ Similar results have been shown by a study conducted in Karachi which states lung cancer to be the most frequent malignancy in males and among the first 10 malignancies in females.⁷ Pakistan has been labelled as a low risk area for lung cancer in women and moderate risk area for men.⁷ Likewise in some areas, women with lung cancers have been shown to have better prognosis.⁶

Some studies quote Adenocarcinoma as the most frequent pattern of lung carcinoma in both males and females⁸ with its relative prevalence ranging between 38.3–52.5%.^{9,10} However a significant number of studies have reported Squamous Cell carcinoma to be the most prevalent histological pattern with frequency ranging from 33–54%.^{11,20} These results were in good agreement with our study which showed Squamous Cell carcinoma to be the most prevalent type 42.7% (Table-3). An overall male to female ratio in this study was 2.67:1 and again this was compatible with male to

female ratio in other Asian countries 3:1.^{11–21} However the ratio was much lower than that in Europe, USA and Turkey where quoted male to female ratio was as high as 20.7:1.²² The ratio in our study was highest in Squamous Cell carcinoma (3.7:1) which was similar to results shown by various other studies.⁸ However in our study Squamous Cell carcinoma was the most common type in both males 46.3% and females 33.3%. This was in contrast to results shown by studies quoting Adenocarcinoma to be the most frequent histological pattern in females.^{3,23}

During the five years study period, Squamous Cell carcinoma showed a significant increase in its prevalence ($p=0.0008$). Although Adenocarcinoma was the second most prevalent pattern in our study, it failed to show a significant change in its prevalence over time ($p=0.2801$). This was in contrast to available literature which has shown an increase in prevalence of Adenocarcinoma over time.^{4,24–27} In a similar manner some studies have shown a decrease in prevalence of Squamous Cell carcinoma with time which was again not in good agreement with our results.^{8,28} Increase in the prevalence of Squamous Cell carcinoma was significant in both males and females ($p=0.0264$) while regarding Small Cell carcinoma significant change in its prevalence was noted only in males ($p=0.0354$). This was in contrast to some studies which have shown a decrease in the prevalence of Squamous Cell carcinoma in males with time.^{9,23,29}

Table-3: Prevalence of various histological patterns of lung carcinoma in different studies

Author	Year	Region	Squamous Cell Carcinoma (%)	Adenocarcinoma (%)	Small (Oat) Cell Carcinoma (%)
Current Study	2010	Pakistan	42.7	20.3	16.4
Menon	1979	Malaysia	34	25	12
Santos-Martinez	2005	-	33	30	-
Makitaro	1999	Finland	40	26	24
Lee	2000	Korea	44.7	27.9	-
Goksel	2002	Turkey	45.4	20.2	20.5
Peng	1996	Taiwan	37.1	38.3	12.2

CONCLUSION

The distribution of histological patterns shown by our study was in good agreement with most of the available literature worldwide. Likewise an overall male to female ratio in our study was very much similar to that found in Asian region; however it was much lower than that in western countries. Squamous Cell carcinoma was the most frequent type in both males and females; in contrast many other studies have shown Adenocarcinoma to be the most frequent type in females. Similarly a number of studies have shown an increase in prevalence of Adenocarcinoma and a decrease in prevalence of Squamous Cell carcinoma with time which was in contrary to the results shown by our study. In this regard, our data proves that changes in trend vary across different

geographical regions. In future, therefore, more efforts are needed to demonstrate changes in prevalence of various histological types and their association with various risk factors. Also prompt intervention and health education is required to reduce the incidence of lung carcinoma and to increase awareness about its risk factors.

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