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AGE-SPECIFIC CLINICO-EPIDEMIOLOGICAL PROFILE OF LUNG CANCERS IN CENTRAL INDIA

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ABSTRACT

Background: Lung cancer exhibits diverse patterns of incidence, prevalence, and clinical attributes, influenced by geographical and demographic factors. This study delves into the gender and age-specific clinico-epidemiological profile of lung cancers in Central India.
Methodology: This study was conducted as an observational study on all the lung cancer patients attending the Outpatient Department of Medicine, Chirayu Medical College and associated Hospital Bhopal during the study period of 2 years.
Results: A total of 1114 patients registered in 2021, 49(4.4%) were lung cancer patients whereas in 2022, a total of 1781 patients were registered, of them, 86(4.8%) patients were lung cancer patients. Out of these 49 patients with lung cancers in 2021, 36(73.4%) were male and 13(26.6%) were female. More than three fourth of the cases with lung cancers in 2021 belonged to age range of 51 to 75 years. In 2022, 63.9% patients belonged to 51 to 75 years age group. About 67(77.9%) were male and 19(22.1%) were female.
Conclusions: Addressing the gender- and age-specific clinico-epidemiological profile of lung cancers in Central India necessitates tailored interventions. Gender-sensitive awareness campaigns, targeted cessation programs, and equitable healthcare access are crucial. Future research should emphasize gender- and age-specific risk assessments, early detection strategies, and treatment protocols to improve outcomes.

Keywords*: Lung cancer, epidemiology, trend, age specific, gender specific.*

INTRODUCTION

Lung cancer remains a complex health concern with distinctive variations in occurrence and characteristics across regions. In 2020, lung cancer was estimated to account for about 11.4% of all new cancer cases globally [1,2]. This made it the most common cancer globally in terms of both incidence and mortality [3]. Lung cancer is also a leading cause of cancer-related deaths [4,5]. It was responsible for approximately 18.0% of all cancer-related deaths in 2020 [3,5,6]. The high mortality rate is often due to the late stage at which many cases are diagnosed.

Central India's demographic and environmental diversity necessitates a focused examination of lung cancer within this context. The burden of lung cancer is immense, both in terms of its impact on individual lives and its strain on healthcare systems. The epidemiological study of lung cancer offers insights into its unequal distribution, shedding light on geographical, cultural, and socioeconomic disparities that shape its prevalence. In this context, the role of epidemiology extends beyond a mere statistical examination of cases; it provides a lens through which the complex web of interactions between genetics, environmental exposures, lifestyle factors, and healthcare infrastructure can be deciphered.

Tobacco smoking is recognized as the leading cause of lung cancer, was one of the earliest triumphs of lung cancer epidemiology, driving public health interventions and policy changes that significantly reduced smoking rates in some

regions. However, the story of lung cancer extends beyond smoking alone. Indoor and outdoor air pollutants, occupational hazards, genetic predispositions, and emerging lifestyle factors are integral components of the broader narrative that epidemiologists continue to unravel.

Studies conducted across Central India reveal gender disparities in lung cancer incidence. Historically, lung cancer has been more prevalent among males due to higher rates of tobacco consumption [7,8]. However, recent trends suggest an increasing incidence among females due to evolving smoking behaviors and exposure to indoor pollutants [9]. Comprehensive gender-specific investigations are warranted to elucidate these evolving trends and their underlying factors.

Lung cancer exhibits a broad age distribution in Central India, impacting various age groups. The incidence rates vary significantly across different age ranges. Among individuals aged 40-60, a notable rise in cases has been observed, potentially linked to cumulative tobacco exposure. The incidence increases steeply in those aged 60 and above due to age-related vulnerability to carcinogenic insults [10,11]. Among those below 40, the incidence remains lower but is increasing, necessitating further investigation into early-life risk factors.

Age-Wise Distribution of Lung Cancer Cases: In Central India, the distribution of lung cancer cases across age groups is as follows:

- Age 20-39: Low incidence, representing a small percentage of cases.
- Age 40-59: Moderate to high incidence, with increasing trends linked to tobacco exposure.
- Age 60 and above: High incidence, reflecting the cumulative effect of risk factors and age-related susceptibility.

Histological subtypes of lung cancer in Central India show consistency with global trends, albeit with variations in gender-specific prevalence. Adenocarcinoma and squamous cell carcinoma are prominent subtypes, exhibiting distinct gender-related patterns [12,13]. Further research is essential to uncover the drivers behind these differences. By studying the age-specific incidence rates, gender disparities, and temporal trends, epidemiologists contribute to our understanding of how lung cancer manifests across different age groups, genders, and time periods. Furthermore, the field explores the histological diversity of lung cancer subtypes and their relationship to risk factors, prognosis, and treatment response. This knowledge guides the development of targeted prevention strategies, early detection methods, and personalized treatment approaches. This study aims to study the age and gender specific distribution of lung cancer to achieve the aforementioned objective.

MATERIALS AND METHODS

This study was conducted as an observational study on all the lung cancer patients attending the Outpatient Department of Medicine, Chirayu Medical College and associated Hospital Bhopal during the study period of 2 years i.e. from 1st January 2021 to 31st December 2022. Only pathologically proven cases with lung cancers were included. The trend of lung cancer cases was assessed age wise during both the years separately.

Statistical Analysis

Data was compiled using MsExcel and analysis was done using Epi Infor 7.2 version software. The age groups taken for classifying these patients were <25 years, 26-50 years, 51-75 years, 76 and above and the data was expressed as frequency and proportion.

RESULTS

A total of 1114 patients registered in 2021, 49(4.4%) were lung cancer patients whereas in 2022, a total of 1781 patients were registered, of them; 86(4.8%) patients were lung cancer patients.

Table 1: Age and gender wise distribution of lung cancer cases in 2021

Sociodemographic variables		No of patients (n=49)	Percentage
Age group	<25	1	2.04
	26-50	9	18.37
	51-75	37	75.51
	>75	2	4.08
Sex	Male	36	73.4
	Female	13	26.6

Out of these 49 patients with lung cancers in 2021, 36(73.4%) were male and 13(26.6%) were female. More than three fourth of the cases with lung cancers in 2021 belonged to age range of 51 to 75 years (Table 1).

Table 2: Age wise distribution of lung cancer cases in 2022

Sociodemographic variables		No of patients (n=49)	Percentage
Age group	<25	3	3.49
	26-50	24	27.91
	51-75	55	63.95
	>75	4	4.65
Sex	Male	67	77.9
	Female	19	22.1

The data showed that the age group most commonly affected was 51-75 years. In 2022, 63.9% patients belonged to this age group. About 67(77.9%) were male and 19(22.1%) were female.

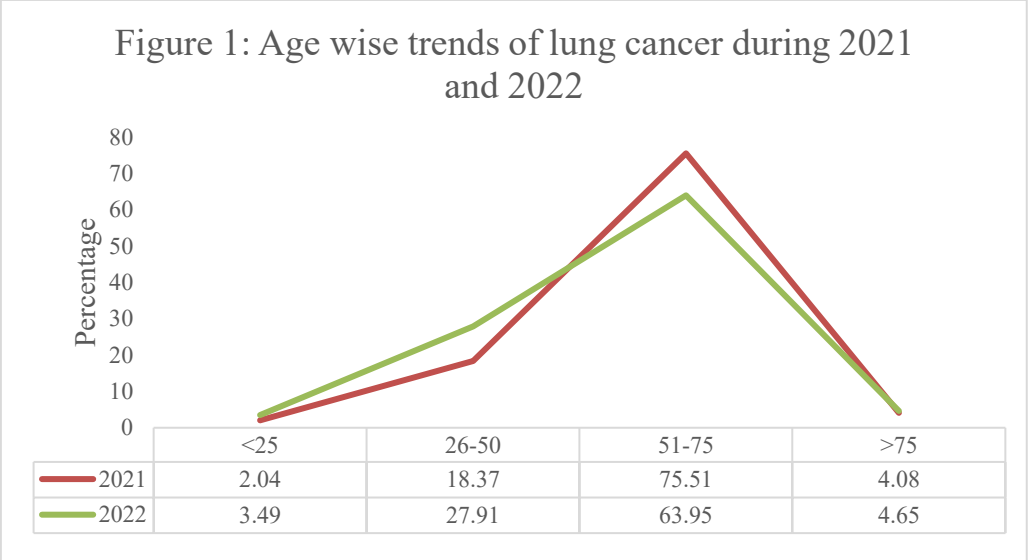

Figure 1: Reveals age wise trend in epidemiology of lung cancer and we reported that 75.51% cases belonged to 51 to 75 years in 2021, whereas about 63.95% cases belonged to 51 to 75 years in 2022.

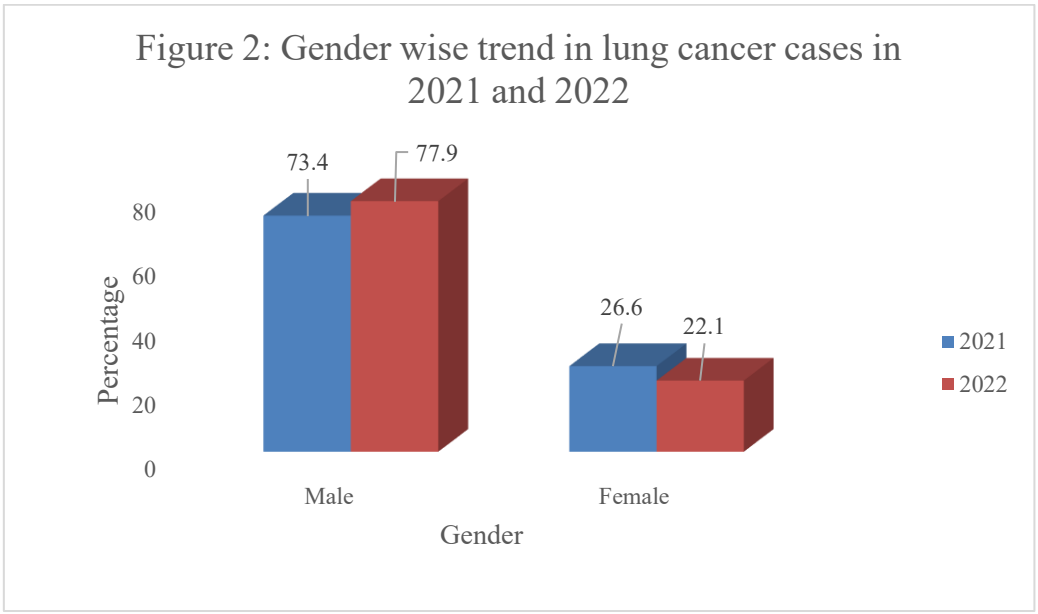

Figure 2: Represents gender wise trend in lung cancer cases. We reported that lung cancer cases increased from 73.4% in 2021 to 77.9% in 2022 in males.

DISCUSSION

World Health Organization estimates cancers as the first or second leading cause of death in 112 countries out of 183 and third or fourth leading cause additional 23 countries in 2019 [14]. During the last few decades, lung cancer has progressed from uncommon to one of the most common cancer Globally attributing to significant deaths across the world [15]. The rate of lung cancer vary across the globe depending upon the prevalence of risk factor such as tobacco use, air

quality etc. The incidence of lung cancer is increasing worldwide and rates are documented to be higher in males as compared to females due to smoking habits. However, due to tobacco control policies in developed countries, the overall incidence of lung cancer is decreasing in men [16,17].

The present study aimed to assess age and gender specific profile of lung cancer patients and we noted slight increase in rate of lung cancers from 4.4% in 2021 to 4.8% cases in 2022. The most common age group affected was 51 to 75 years during both the years, with male predominance. In our study, there was slight increase in lung cancer cases in 2022 as compared to 2021 in the age group of less than 25 years (from 2.04% to 3.49%), 26 to 50 years (from 18.37% to 27.91%) and more than 75 years (from 4.08% to 4.65%). However, the cases decreased slightly in 51 to 75 years of age. Overall, majority of cases belonged to age group of 51 to 75 years in our study.

Our study findings were supported by findings Ramani et al, in which more than 60% cases with lung cancers belonged to age range of 51 to 70 years [18]. Cruz et al in their study also reported median age of 71 years for lung cancer cases, during the surveillance period of 2004 to 2008 [19]. Bade et al in their Surveillance, Epidemiology end results (SEER) data 21 documented 55.4% cases in age range of 55 to 75 years, supporting our study findings [20]. On the other hand, Jindal et al reported 40.2% cases below 50 years of age [13].

In the present study, during both the years, majority of cases were males and we noted slight increase in cases of cancer in males i.e. from 73.4% in 2021 to 77.9% in 2022. Similar findings were reported by Ramani et al, where the male preponderance was noted for lung cancer with male:female ratio of 2.95:1 [18]. Jindal et al also documented lung cancer predominantly in males with male:female ratio of 4.5:1 [13]. Dey et al documented risk of lung cancer to be 1.5 times higher in males as compared to females, supporting our study findings [21]. The higher risk of lung cancer in males in our country could be attributed to higher rate of smoking habits among males as compared to female. However, as a result of lifestyle changes, urbanization and westernization, females are also consuming smoking, which may be the risk factor for lung cancer among them [7].

Our study had certain limitations, first, the risk factors such as smoking, air quality index were not taken into consideration. Second, the histopathology of lung cancers was not taken into account. Only age and gender specific lung cancer cases were studied that too for the period of 2 years and hence long term epidemiological trend and changing pattern could not be studied.

CONCLUSION

Addressing the gender and age-specific clinico-epidemiological profile of lung cancers in Central India necessitates tailored interventions. Gender-sensitive awareness campaigns, targeted cessation programs, and equitable healthcare access are crucial. Future research should emphasize gender- and age-specific risk assessments, early detection strategies, and treatment protocols to improve outcomes.

Understanding the evolving trends across genders and age groups is indispensable for effective prevention, diagnosis, and treatment strategies. Collaborative efforts among healthcare professionals, researchers, policymakers, and communities are vital to address the distinct challenges posed by gender- and age-related variations in lung cancer within the Central Indian context.

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