



A SINGLE INSTITUTIONAL EPIDEMIOLOGICAL STUDY OF PATIENTS OF NON SMALL CELL LUNG CARCINOMA WITH BRAIN METASTASIS AT PRESENTATION

Oncology

Saptarshi
Banerjee*

Tutor, Dept. Of Radiotherapy, NRS Medical College, Kolkata, *Corresponding Author

Biswarup Banerjee Medical Officer, Dept. Of Radiotherapy, NRS Medical College, Kolkata

Srikrishna Mandal Professor and HOD, Dept. Of Radiotherapy, NRS Medical College, Kolkata

ABSTRACT

Brain metastasis is a dreaded complication among patients of different cancers, including lung cancer. Approximately 16 to 22% of patients with lung cancer develop brain metastases. Non small cell lung carcinoma (NSCLC) accounts for the maximum proportion of all lung cancer cases. Brain metastases during presentation carries a poorer prognosis than metachronous brain metastases in NSCLC cases. This study was aimed to retrospectively analyze the epidemiological pattern of NSCLC patients presenting with brain metastases, attending a tertiary health care centre during a period of one year. Total 22 patients, out of 198 NSCLC cases had brain metastases at presentation. There was not much difference in rate of brain metastases between male and female. Rate of brain metastases at presentation was more in case of adenocarcinoma, than in squamous cell carcinoma, though the difference was not statistically significant.

KEYWORDS

Non Small Cell Lung Cancer, Brain Metastases, Adenocarcinoma, Squamous Cell Carcinoma

INTRODUCTION

Brain metastasis is a common and dreaded complication of various cancers. Brain metastasis is particularly common among patients with lung cancer. Brain metastases are a significant problem in lung cancer patients, which accounts for approximately half of all solid tumor metastases to the brain.^{1,2} It has been estimated that 16 to 22% of patients with lung cancer develop brain metastases.³⁻⁵ Non Small Cell Lung Cancer (NSCLC) accounts for around 87% of lung cancer cases and approximately 40% of patients are diagnosed with metastatic disease at presentation, with the most common sites of distant metastasis including the brain, liver, adrenal glands and bones.⁶⁻⁸ In patients with NSCLC, frequency of brain metastases remains unknown. Several estimates have been reported in the literature, which have been limited by small sample size and selection bias due to the setting from which these patient samples are drawn.⁹⁻¹¹ Aim of this study is to retrospectively analyze the epidemiological pattern of NSCLC patients presenting with brain metastases, attending a tertiary health care centre during a period of one year.

METHODS

History sheets of the patients of non small cell lung cancer (NSCLC), attending the department of radiotherapy of a tertiary health care centre of West Bengal, India, from December 2018 to November 2019 were retrospectively analyzed. The patients presented with brain metastases at the very first visit were identified. Epidemiological patterns of NSCLC presenting with brain metastasis from the beginning were analyzed.

RESULTS

A total of 198 patients of non small cell lung cancer (NSCLC) presented during the one year period. Among them, 117 were adenocarcinomas, 78 were squamous cell carcinomas, and 3 cases were large cell carcinomas. The mean age of those NSCLC patients was 57.5 years. Among 198 cases, 135 patients were male and 63 were female.

Total 22 (11.11%) patients out of 198 NSCLC cases presented with brain metastases from the very first presentation. Among them, 8 patients were symptomatic (headache, dizziness, vomiting etc.) and 14 cases had asymptomatic brain metastases. Among 117 adenocarcinoma cases, 17 (14.53%) patients had brain metastases, and among 78 squamous cell carcinoma cases, 5 (6.41%) cases had brain metastases at presentation (Table 1). Though percentage of brain metastases among adenocarcinoma cases was more, the difference was not statistically significant (chi square p-value= 0.079) (Large cell carcinoma cases were not included in analysis as only 3 cases were found, and no brain metastasis was present among them).

Table 1. Brain metastases at presentation in different histologic subtypes of NSCLC (Chi square p-value= 0.079)

Type of NSCLC	Brain mets present	Brain mets absent	Total
Adenocarcinoma	17	100	117
Sq. cell carcinoma	05	73	78
Total	22	173	195

Out of 135 male patients, 16 (11.85%) patients and among 63 female cases, 6 (9.52%) patients presented with brain metastases (Table 2). There was no statistically significant difference in cases with brain metastases between male and female (chi square p-value=0.63).

Table 2. Male female distribution of patients of NSCLC with brain metastases at presentation (Chi square p-value= 0.63)

Gender	Brain mets present	Brain mets absent	Total
Male	16	119	135
Female	06	57	63
Total	22	176	198

All patients received palliative cranial radiotherapy and systemic therapy.

DISCUSSION

The prognosis of the patients of non small cell lung cancer (NSCLC) with brain metastases is poor, even after administration of palliative radiotherapy, different systemic chemotherapy and targeted molecules. The apparent incidence of brain metastases has been increasing because of widespread use of MRI, that detects subclinical diseases also. Even with treatment, the prognosis for these patients remains poor, with a median survival of 7 months, but patients with systemic disease control, brain only metastasis, good performance status and younger age have better outcomes.¹²⁻¹⁴ Patients with lung cancer frequently suffer from brain metastases at the time of presentation. This condition affects approximately 10% of NSCLC patients.^{15, 16} Prognosis in case of brain metastases at the time of presentation is poorer than metachronous brain metastases.¹⁶

In our study, 22 patients, out of total 198 non small cell lung cancer cases had brain metastases at presentation, during a period of one year. Among them 135 patients were male and 63 were female. There was not much difference in rate of brain metastases between male and female. So far as the histologic subtype of NSCLC is concerned, rate of brain metastases at presentation was more in case of adenocarcinoma (14.53%), than in squamous cell carcinoma (6.41%), though the difference was not statistically significant (p-value= 0.079).

CONCLUSION

Brain metastasis is a dreaded complication in lung cancer patients. Prognosis becomes even poorer if there is brain metastasis at the presentation. In our study, approximately 11% non small cell lung

cancer patients had brain metastases at presentation. Though adenocarcinoma patients had a higher rate of brain metastases at presentation, it was not statistically significant.

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