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RESEARCH ARTICLE

Brain Metastasis in cancer patient - Retrospective Analysis

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ABSTRACT:
Cancer is second most common cause of death in western world. Brain metastasis is commonest cause of intracranial neoplasm in adults and occurs with high rate of mortality and morbidity.Approximately 15% of patients with primary tumor metastasize to central nervous system. **Material and Method:** All the patient from Dec 2000 to 2014, who were attended and received their treatment at radiation oncology department of IGIMS Patna were analyzed according to their age, sex, histological type, duration of presentation, presenting symptoms and their demographic profile. **Results:** Commonest age group which was presented in our study was 40 to 60 years of age in both sexes.About 66.5% cases males and 33.5% were females. Lung carcinoma was the commonest cancer(34%) followed by breast carcinoma 15.7%, Prostate 9.6%, Head and neck cancer 10%, lymphoma 9.6%. majority of the cases were of low socio economic status, illiterate. **Conclusion:** Due to illiteracy, ignorance, low financial status patient usually present with advanced stage of disease. It increases mortality and morbidity, which creates fear about the disease in the society.

Keywords: Cancer patients, brain metastasis, retrospective analysis

INTRODUCTION

In Western world cancer is the second most common cause of death[1]. Metastatic brain tumors are the most common intra cranial neoplasm in adults and occur with high rates of mortality and morbidity[2]. Brain metastasis is the most common diagnosis on referred patients who are referred because of neurologic complication in systemic disease.In approximately 15% of all patients with cancer, the primary tumor metastasizes to the central nervous system[3]. The incidence rate of primary brain tumor is 6.6 per 1,00,000[4] and incidence rates of metastatic brain tumor varied from 8.3 per 1,00,000[5].

Approximately 1,00,000- 170000 new cases of brain metastasis are diagnosed in united states every year. at autopsy about 20% - 40% of all cancer patient have metastasis[6]. Brain metastasis originates from lung 40 to 50%, breast 15 to 25%, and Melanoma and kidney 5 to 20% & 5 to 10% respectively[7]. About 5 to 10% patient present with brain metastasis with unknown primary[8].According to American cancer society approximately 175000 cancer patient develop brain metastasis[9].

There is some evidence that the frequency of brain metastasis is increasing due to longer survival of patients because of more aggressive and effective treatment of primary tumor. The use of better imaging technique may also contribute to a higher detection rate of brain metastasis[10].

In our region where the literacy rate is very low, low socio economic status of the patients, ignorance about the disease and their complications are mainly responsible for advance stage of disease usually patients presented with advance stage of disease or brain metastasis at presentation. We present this retrospective study to detect the incidence and pattern of brain metastasis in our setting.

MATERIAL AND METHOD:

This is a retrospective study conducted in radiation oncology department IGIMS, Patna. All of the patients attended our department from Dec, 2000 to Dec, 2014. All the cases were histological proven for malignancy. All of the cases were analyzed according to their age, sex, disease. Clinical profile of these patients in regard to histology of tumor, stage disease, presence or absence of neurological symptoms was analyzed.

RESULTS:

There were 361 patients between Dec2000 to 2014 presented with brain metastasis in our department. Majority of patients were of 40 -60 years of age in both sexes. Out of 361 patient 66.6% patients were male & 33.5% were female. Carcinoma lung was most common cancer in all patients. It contributed 34% cases. In male lung carcinoma & prostate carcinoma were more common. They contributed about 1/3 of cases.

In females breast carcinoma was commonest cancer. It contributed 43% among female & 15.7% in all cases of brain metastasis. About 10% cases of head & neck cancer and 7.7% cases of lymphoma presented with brain metastasis. 8.8% cases of unknown primary presented with brain metastasis. Out of 361 cases 74% patients presented with multiple lesions and 26% cases presented with single lesion in brain. Most of the patients were of low socio economic status and belong to rural area. About 45% patients were illiterate in both sexes.

Table 1

	Secondaries Brain= 361	
Age	Male = 240	Female = 121
<10	1	0
11- 20	1	1
21- 30	15(6.2%)	6(4.9%)
31- 40	47(19.5%)	18(14.8%)
41- 50	46(19.1%)	44(36.3%)
51- 60	94(39.1%)	38(31.4%)
61- 70	31(12.9%)	11(9%)
71- 80	5(2%)	3
	Mean for male 49 $\pm$ 5	Mean for Female 48 $\pm$ 5

Table 2

No of Patient of brain Metastasis according to disease

Site	Total no of patients	Male (240)	Female(121)
Breast	57(15.7%)	5	52(43.8%)
Lung	123(34%)	102(42.5%)	21(17.3%)
Prostate	35((9.6%)	35(14.5%)	0
Head and Neck	39(10%)	39(16.2%)	0
Lymphoma	35	24	11
Sinonasal	11	8	3
Pancreas & Gall Bladder	8	6	2
Genitor urinary ca	14	0	14
Bone Tumor	7	7	0
Unknow Primary	32(8.8%)	14	18

Table 3

Interval between Primary tumor and Brain Metastasis

Disease	Total no Of Patients	At presentation	<3 mt	1 yr	2 yr	3 yr
Breast	57	39	0	6	7	5
Lung	123	74	16	8	10	7
Prostate	35	21	7	5	2	0
Head and Neck	39	14	7	7	5	6
Lymphoma	35	15	5	8	5	2
Sinonasal	11	5	3	3	0	0
Pancreas & Gall Bladder	8	6	2	0	1	0
Gynecology ca	14	8	1	2	3	0
Bone Tumor	7	2	3	2	0	0
Unknow Primary	32	32	0	0	0	0
Total patient	361	216(59%)	44	41	32	22

Table 4

Literacy Rate

Education status	Total no of Patients	Male	Female
Lllitrate	163(45.1%)	65	98
UP to Primary	127(35.1%)	58	69
Middle	35(9.6%)	28	7
UP to 12^{th}	21	17	4
Graduate/ Post graduate	15	14	1

Table 5

Socio Economic Status

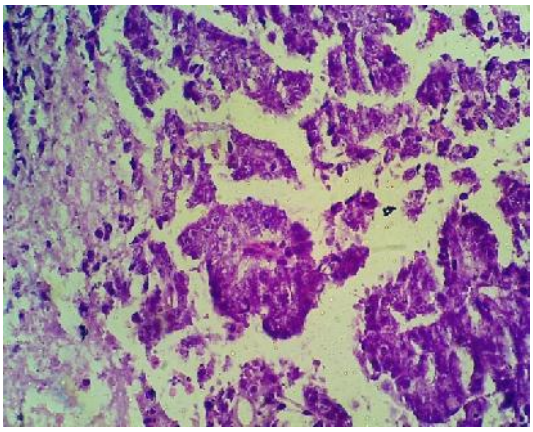
Income Group	Total no of Patients (361)	Male (240)	Female (121)
< 5000	137(37.9%)	93	44
5000 – 10000	187 (51.8%)	135	52
>10000	37 (10.2%)	12	25
	361	240	121

Table 6

	Total no of Patients (361)	Male (240)	Female (121)
Rural	225(62%)	125	100
Urban	136(37.6)	72	64
	361	240	121

DISCUSSION:

Brain metastasis usually present with headache, vomiting, focal neurological deficit, visual disturbances. Symptoms depend upon the area of involvement. Treatment of brain metastasis is multi disciplinary which include radiotherapy, chemotherapy, steroid and symptomatic treatment. In our study the most common age group was 40 to 60 years in both sexes 42% male presented with age group of 40 to 60 years and 66% female presented with this age group Takokura et al reported the common age of brain metastasis patient among male was 56 years and among female was 40 years[11]. In our study lung carcinoma cases presented with brain metastasis were 34%. Some studies reported the incidence rate of brain metastasis from lung carcinoma 9.7% to 54%[(12,13-19)]. Other studies reviewed nine studies and reported the incidence of brain metastasis from lung carcinoma 18 – 64%[20], while victor[21] has reported 48%. In our study the incidence of brain metastasis from breast carcinoma was 15.7% while other study reported 2 to 21% [20]. Study done by victor[21] reported 15% Takokura[11] reported 25%. Other carcinoma like head & neck cancer, prostate, lymphoma presented with 10%, 9.6%, 7.7% cases respectively in our study. These incidence rate supported by other studies like victor reported head & neck cancer 6% and lymphoma 1%. We did not find any case of melanoma, renal cell carcinoma, thyroid in our study. 8.8% cases of unknown primary presented with brain metastasis they presented with other site of metastasis, plural effusion, ascitis, and lymph node involvement. Majority of the cases presented with brain metastasis at the time of presentation (59%). Headache (58%) was the commonest presentation in our study. Some studies reported 49%[10], 42%[15]. In our study 45% patient were illiterate, 51.8% patient belong to lower socio economic status (income range 5000 to 10000 rs/month). Most of the patients belong to rural area these are some of factors responsible for advanced stage of disease at the time of presentation.



Metastatic carcinoma (Histopathological picture)

CT scan showing single lesion of brain metastasis

CONCLUSION:

Our study shows the distribution of common cancer presented with brain metastasis patient should be educated about the clinical symptoms of different kind of cancer, progression of disease advancement of diagnostic techniques and treatment of cancer. Majority of cases presented with advance stage of disease due to illiteracy, low financial status, and ignorance about the health facilities. It increases the mortality and morbidity of cancer patients. It creates fear about the disease in the society.

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Dr. Seema Devi, MBBS, MD (Radiation Oncology)

Biography

Dr. Seema Devi served 16 years in the field of Radiation Oncology; she started her journey from S.N. Medical College, Agra as a resident in the year 1997. Then after completing M.D in the year 2000 she moved to Safdarjang Hospital, New Delhi and worked there in the capacity of senior resident till 2002. Dr. Seema joined Department of Radio therapy, J.N. Medical College, Aligarh as an Assistant Professor in the year October 2002. She served there relentlessly for more than 12 years in the field of Radiation Oncology. There she was involved in the treatment of gastrointestinal cancers, breast cancer, sarcoma, and general radiation oncology and brain and central nervous system cancers. Dr. Seema now is working as an Associate Professor in Oncology Department of Indira Gandhi institute of Medical Sciences, Patna since October 2014, dealing with different type of radiation therapy techniques including accelerated partial breast irradiation and other protocol options.

Dr. Seema Devi Patient Care Philosophy

"I believe in individualized care and making decisions with my patients as a partnership."