

PALLIATIVE CARE IN PATIENTS WHO RECEIVE WHOLE BRAIN RADIOTHERAPY FOR BRAIN METASTASES IN AHMADU BELLO UNIVERSITY TEACHING HOSPITAL, ZARIA

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ABSTRACT

BACKGROUND

Brain Metastases is a devastating complication of Cancer affecting 10-50% of patients with systemic disease. It by far outnumbers primary Brain tumor in a 10:1 ratio.

AIMS AND OBJECTIVE

To determine the age distribution, gender distribution, tumor of origin, commonest radiotherapy regimen and median survival of patients who received Whole Brain Radiotherapy for Brain Metastases.

MATERIALS AND METHODS

Between May 2006-May 2015 patients who received Whole Brain Radiotherapy for Brain Metastases for confirmed Brain Metastases were studied in a Retrospective study and evaluated with respect to age, gender, tumor of origin and radiotherapy regimen. Patients Case files and treatment files were reviewed and results were analyzed using SPSS version 20th Edition.

RESULTS

A total of 30 cases were reviewed. The age range of patients was between 16-70 years with a mean age of 43.5 years. Median age of 41.5 years. 83.4% of patients were female with remaining 16.7% males. The commonest tumor of origin was Breast Cancer (76.7%) followed by Lymphoma (6.7%), Lung (3.3%), Colon (3.3%), Endometrium (3.3%), Pancreas (3.3%), Paranasal Sinus (3.3%). Majority of patients 73.3% received 30Gy in 10# over 2 weeks. Median Survival is 3 months. The most common clinical presentation is Headache (46.6%).

CONCLUSION

Most Patients presented at advanced stages of their diseases. The mean age of patients that received Whole Brain Radiotherapy were in the fifth decade of life. More Females than Males received Whole Brain Radiotherapy.

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INTRODUCTION

Brain Metastases are neoplasms that originate in tissues outside the Brain and then spread secondarily to the brain. Brain metastases have excited neurological interest since the first case was reported in Schrautin 1853¹. It is a devastating complication of malignant disease, outnumbering primary Brain tumor by a factor of 10:1.² The exact frequency of Brain metastases is difficult to determine with precision, but they are estimated to affect 25% of Cancer patients.³ In an autopsy series done at the University College Hospital Ibadan, the incidence rate for Brain Metastases was 6.4%.¹

Incidence of Brain Metastases is increasing due to an ever increasing ageing population, therapeutic control of systemic disease, inability of the drugs to penetrate the blood brain barrier, aggressiveness and biology of the tumor.^{4,5,6}

Most Brain Metastases originate from Lung (40-50%), Breast (15-25%), Melanoma (5-20%) and Kidney (5-10%).² No Tumor of origin /primary site of cancer is detected in 5-10% of patients with Brain Metastases.⁷

Brain Metastases are suspected in any cancer patient who develops any new neurological symptoms. Common symptom of Brain Metastases results from raised Intracranial Pressure such as headaches, seizures, Vomiting.⁶

MRI has become the standard of care for imaging of the Central Nervous System in Cancer Patients.

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Treatment of Brain Metastases is multidisciplinary with radiation forming the cornerstone of treatment. It is a major component of treatment of cancer in African Countries providing effective palliative relief in 70-80% of patients.^{8,9}

Although Whole Brain Radiotherapy is still a standard and active treatment in the management of Brain Metastases, trials of concurrent chemotherapy and Whole Brain Radiotherapy suggest a significant increase in response rate especially for metastases from lung cancer.⁹

Chemotherapy maybe used as first line treatment in patients with Germ cell Tumor, Small cell Carcinoma, and Lymphoma. The response rate of brain Metastases to chemotherapy is similar to the response rate of the primary tumor and extracranial metastases with some being more chemosensitive than others.¹⁰

Supportive measures are often critical in improving patient outcome. They include treatment against vasogenic edema, pain and seizures. Because the management of Brain Metastases is palliative it is important to avoid any treatment that is useless or harmful or has a poor toxicity efficacy ratio.¹¹

MATERIALS AND METHODS

Study Area - The study was conducted in the Department of Radiotherapy and Oncology of the Ahmadu Bello University Teaching Hospital Zaria. The center is situated in North Western Nigeria and serves as a referral center for patients within the region and across the country.

Study Design - The study was a retrospective review of patients treated with Whole Brain Radiotherapy for Brain Metastases between May 2006 and May 2015.

Method-Patients with histologically confirmed systemic malignancy, Radiologically detected Brain Metastases and have received Whole Brain Radiotherapy were eligible for the study. Treatment files with incomplete data were excluded.

A Total number of 30 files were obtained. Data were retrieved from the treatment files and supplemented by information from the case notes. Data collected included Age, Gender, Tumor of origin, clinical presentation and Radiotherapy Regimen

Data Analysis -Data Analysis was done using Statistical Package for Social Sciences version 20

RESULTS

A Total of 30 cases were reviewed. The age range was between 16-70 years with a mean age of 43.5 years. Median age 41.5 years.83.4% of patients were female with remaining 16.7% males.The commonest tumor of origin was Breast (76.7%) followed by lymphoma (6.7%), Lung (3.3%), colon (3.3%), Endometrium (3.3%), Pancrease (3.3%), Paranasal Sinus (3.3%). Majority of Patients 73.3% received 30 Gy in 10 # over 2 weeks. 13.3% received 15Gyin 5 # over weeks and 6.7% received 20Gy in 5 # over 1 week. Median Survival was 3 months. The most frequent neurological symptom is Headache(46.6%).

TABLE 1. Distribution of Tumor of Origin and Age.

Age	Breast	Lung	Lymphoma	Colon	Endometrium	Paranasal	Pancreas	Frequency	Percentage
15-19			1					1	3.3
20-24	0								-
25-29	3							3	10
30-34	3							3	10
35-39	3							3	10
40-44	6							6	20
45-49	5			1				6	20
50-54	1		1					2	6.7
55-59	1	1						2	6.7
60-64						1		1	3.3
65-69	1						1	2	6.7
70-74					1			1	3.3
Frequency	23	1	2	1	1	1	1	30	100
Percentage	76.7	3.3	6.7	3.3	3.3	3.3	3.3		100

TABLE 2. Cross-tabulation of age and tumor of origin

AGE(years)	Breast	Lymphoma/others	Total
<40	9	1	10
40+	14	6	20
Total	23	7	30

FIG 1. Gender Distribution of Patients

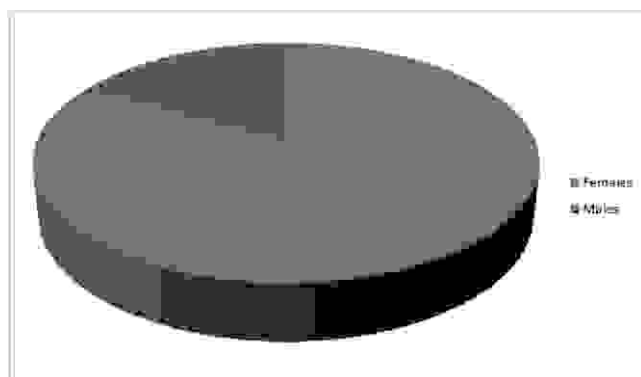


Table 3. Distribution of Radiotherapy regimen

Radiotherapy Regimen	Frequency	Percentage
30Gy in 10#	22	73.3
30Gy in 15#	2	6.7
15Gy in 5#	4	13.3
28Gy in 7#	1	3.3
20Gy in 5 #	1	3.3

DISCUSSION

Findings from this Study revealed that majority (60%) of patients were in the 3rd and 4th decade of life, this is in accordance with the results of the University College Hospital Ibadan where 82.4% of patients were in the 3rd and 4th decade¹. According To Schouten et al, there is evidence of a lower incidence of Brain Metastases in the group of patients age > / 70 this may reflect diagnostic bias, because it is likely that diagnostic work-up to detect Brain Metastases probably will be less extensive in older patients compared with younger patients.¹²

The mean age of 43.5 years and Median Age of 41.5 is similar to the study by Popoola et al in Lagos with Mean and Median Age of 44 and 48 years respectively.¹³ The Mean Age of patients in a study in Iran by Ali et al was 53.6 years.¹⁴ The Mean age in the developing countries is lower than that seen in developed countries; Schackert et al and Wolf et al both showed a Mean Age of 67 and 60 years respectively in Germany and the US.^{15,16}

Among 35 Radiotherapy centers evaluated in African countries, Brain Metastases were being treated by Radiotherapy to the Whole Brain to 30GY in 10 Fractions either exclusively or in addition to the use of 20GY in 5 Fractions⁸. In the United Kingdom, the standard treatment is 30Gy in 10# or 20Gy in 5 # over 2 weeks to the brain.¹⁷ This is in accordance with this

study where majority of patients were treated to 30GY in 10 Fractions over 2 weeks. The study by Edward et al however revealed that 81% Of patients treated received 20Gy in 5# over 1 week.¹⁸

In the present study Females by far outnumber males, this could be attributed to the fact that majority of the patients that were treated for Brain Metastases had Breast Cancer which is more common in females than males. In a study by Olasode et al 32 (75%) of the 48 patients with brain metastases were females.¹⁹ Similar results were also observed at a Radiotherapy Facility in Lagos where 80% of Patients were females.¹³ This however is in variance with Saha et al where most of the patients were males.²⁰

According to studies done in Memorial-Kettering Cancer Center in New York by Victor TS and Takokura K, Ho SH et al in Tokyo, the most common primary producing Brain Metastases are Cancer of the Lung (40-50%) followed by Breast Cancer (15-25%).²¹ These results are in contrast with this study where the most common primary tumor was breast cancer 76.7%, with Lung Cancer accounting for 3.3%. This is however in agreement with a study at the Jos University Teaching Hospital Jos Plateau by G.O. Igun where the commonest origin of metastatic Brain tumor was breast.²²

The Average Survival of Patients with Brain Metastases is typically less than 6 months, it is well recognized that subgroups of patients have significant probability of longer survival. Median survival in this study was 3 months in accordance with studies by Lang et al and Order et al that revealed median survival of 3-4 months.^{23,24} According to Pearse, the median survival for unselected patients with Brain Metastases was 3-6 months.²⁵ Tse Victor had a slightly lower median Survival of 2.3 Months.²⁶

Headache was the commonest clinical presentation in this study similar to what was recorded by Obajimi et al at the University College Hospital Ibadan.⁶

CONCLUSION

Breast Cancer is the most common tumor of origin in Patients receiving Whole brain radiotherapy for Brain Metastases with the mean age of presentation at 43.5 years. Majority of Patients are females. 30Gy in 10 # was the most common regimen received by Patients and the median survival for patients is 3 months.

Control of Brain metastases remain challenging. Despite multimodal treatments, development of brain metastases occur not only in patients who already have distant spread at diagnosis, but also in cancers that may be treated with a curative intent.

Treatment is palliative and Best supportive care remains the best option in patients with poor performance status (KPS <70), advanced non-cranial disease and a poor life expectancy.

There should be more concerted efforts in improvement of palliative radiotherapy practises in the treatment of brain metastases.

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