

External Beam Radiotherapy in Metastatic Bone Pain from Solid Tumours in Zaria, Nigeria

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Introduction

Bone metastasis is a manifestation of late stage of cancer. Its consequences such as bone pains impair patient's quality of life^{1,2}. Among the contemporary modalities of metastatic bone pain treatment, radiotherapy has been considered as the treatment of choice³⁻⁶. Varying incidence (8.0% - 19.6%) of bone metastasis has been recently reported from Nigeria^{7,8}.

Bone pain from metastatic cancer can be effectively palliated by external beam irradiation and

Abstract

Aim

To evaluate the effectiveness of external beam irradiation in bone pain secondary to metastases; with emphasis on the onset of symptoms relief, the duration of response and relate onset of pain relief to age in = 40 years and = 40years patients.

Setting

Ahmadu Bello University Teaching Hospital, Zaria, Nigeria.

Result

Breast cancer is the commonest cause of metastatic bone pain from solid tumours in Zaria, Nigeria. Females were more commonly affected. Two out of every 5 patients were less than 40 years old. Eighty-six percent of the patients obtained significant pain relief in the first week of treatment.

At 12 weeks, the mean pain score and analgesic scores were 0.67 and 0.16 respectively.

Conclusion

External beam irradiation is an effective treatment modality in an African population with metastatic bone pain.

Key Words: Bone, metastasis, radiotherapy, pain, control

randomized studies and meta-analyses have described the efficacy of external beam radiotherapy in pain palliation, with the overall responses ranging from 66.0% - 88.0%^{9,10}. However, the impact of this modality in metastatic bone pain has not been fully studied in our centre which is one of the National centres for oncology in Nigeria.

Patients and Methods

Consecutive histologically-proven cancer patients in whom the lesion is a primary solid tumour, presenting with metastatic bone pain between January 2006 and December 2008 were prospectively studied.

All patients had radiological evidence of metastasis. Data collected were demographics, primary tumour site, clinical and radiological metastatic sites, number of metastatic bone deposits, radiation dose and systemic therapy received.

Data were entered into a proforma in prospective study. Evaluation of baseline pain, was done using a linear visual analogue scale (VAS) from 0 to 10. Analgesic consumption rate was assessed at the commencement of Cobalt -60 photon radiation treatment. The doses of radiation received ranged from 600cGy to 30Gy given in therapeutic fractionations.

Analgesic consumption was evaluated using a 0 to 4 scale (Table 1). Patients were re-evaluated for pain level and the degree of analgesic use at 4 weeks and 12 weeks. Results were analysed using SPSS ver. 15.

Results

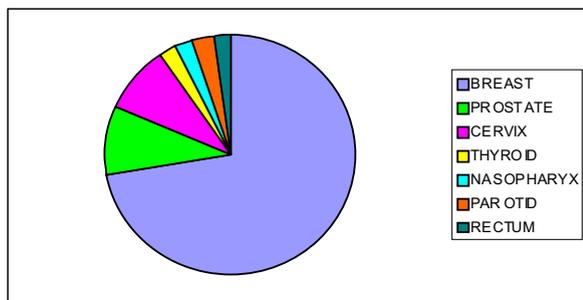
Forty-three patients were studied. There were 10 males and 33 females. Male: Female = 1:3.3. Mean age was 44.4± 10.6 years. Age range was 27years to 75years. Seventy-two point one percent (72.1%) of the patients were below the age of 50 years.

The most common primary cancer sites were breast, prostate and cervix accounting for 72.1%, 9.3% and 9.3% respectively (Fig. 1).

Table 1: Analgesic Score Scale.

Analgesic Score Scale	
0	none
1	Simple analgesics
2	Mild narcotics
3	Strong narcotics
4	Inadequate narcotics

SITE OF PRIMARY MALIGNANCY



Breast cancer was most common (72.1%) site

Figure 1: Site of Malignancy

Fifty-three point five percent (53.5%) of patients had primary disease insitu at presentation. Seventy-four point four percent (74.4%) of patients had movement restrictions while 26.0% and 4.7% had sensory loss and autonomic dysfunction respectively at presentation.

The vertebral column was the commonest site of metastatic deposits (Table2).

Table 2: Distribution of Bone Metastases.

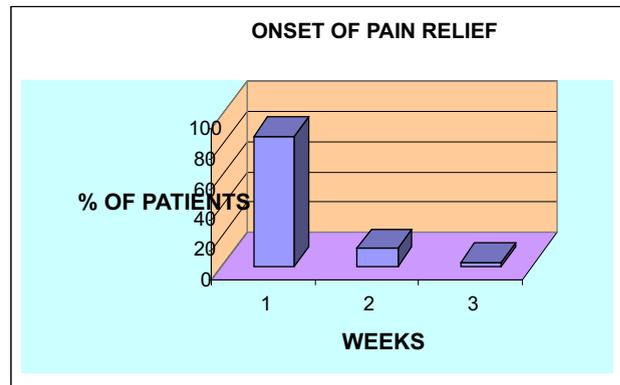
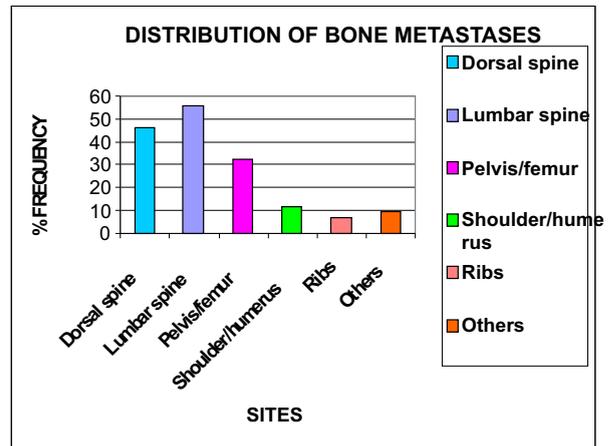


Figure 2: Onset of Pain Relief.

85% of the patients had pain relief in the first week of irradiation.

Twenty-three patients (53.4%) had single site, while the others had two or more bone metastatic sites. Thirty point two percent of patients had visceral metastases.

The mean pain score at baseline was 7.9± 1.5 while the mean analgesic score was 2.3±0.5. (Table 3).Eighty-six percent of the patients obtained significant pain relief in the first week of treatment using VAS (Fig 2).

At 12 weeks, the mean pain score and analgesic scores were 0.7 ± 0.8 and 0.2 ± 0.4 respectively (Table 3).

No difference was observed in the onset of pain relief between patients below 40 year and those 40 years and above.

Table 3: Pre and Post Irradiation Scores.

Weeks	Mean Pain Score (SD)	Mean Analgesia Score(SD)
0(pre- irradiation)	7.9(1.5)	2.3(0.5)
4(post-irradiation)	2.6(0.9)	0.7(0.5)
12(post-irradiation)	0.7(0.8)	0.2(0.4)

A significant reduction in both pain and analgesia scores after irradiation : 7.9 vs 0.7 and 2.3 vs 0.2 respectively.

Discussion

Majority of patients in the study were females and the male to female ratio was 1:3.3. This observed preponderance was due to the number of breast cancer patients. It has been variously reported^{7,11,12} that breast cancer is the commonest cancer when both sexes are combined. In Nigeria, it is the most common and sometimes the second most common malignant disease among women^{13,14}

The study showed that 72.1% of the patients were below the age of 50 years, with a mean age of 44.4 years in contrast to reports on Caucasians with bone metastasis with mean age of $66.9 \text{ years} \pm 10.7$ ^{15,16}. Majority of our patients were young ≤ 50 years old. This is probably a reflection of the observation that cancer afflicts the younger age group in developing countries when compared to industrialized countries¹⁷. This finding shows that bone metastases occur a decade or two earlier in the African cancer patients and may be due to the demographic profile in developing countries. Breast cancer was the most common primary disease among the study population. This is in accordance with reports in indigenous African populations¹⁸ and in contrast to reports from the developed countries where other solid tumours, such as prostate and lung cancers, are the most common primary tumours in patients with bone metastases^{19,22}.

It is of note that half of the patients had primary disease in situ. This is due to the fact that cancer patients in Nigeria still present to hospitals late, usually with advanced and metastatic diseases^{7,8}.

Various reasons for late presentations of cancer patients include fear of the unknown, illiteracy, tradition and cultural beliefs among others^{23,24}. Some of the patients had complained of bone pains for not less than 2 months and had visited orthodox medical practitioners and were given non-steroidal anti-inflammatory drugs. Seventy-six point seven percent of the patients admitted to using over-the-counter drugs and other native concoctions. The vertebral column was found to be the most common site of bone metastasis.

Similar findings had been reported in the literature²⁵. Eighty-six percent of the patients obtained significant pain relief in the first week of treatment and by the 12th week all the patients had achieved significant pain relief. This is in accordance with the reports of other studies²⁶. According to literature reports, median time from treatment to pain relief was 3 weeks²⁷. The degree of pain relief achieved by the patients could be seen in gradual reduction in the analgesic requirement. During the period of study, none of the patients had pain re-occurrence requiring re-irradiation.

There are various scales for measuring pain in the literature. These include Brief Pain Inventory²⁸, Visual Analogue Scale²⁹, McGill Pain Questionnaire (MPQ)³⁰, Numerical 11 point box (BS-11)³¹, 4 point verbal rating scale and 101- point scale³². The VAS used in this study was found to be simple and easy to understand by the patients. It is the authors opinion that it is useful in low resource country where the patients are not very literate and its use is recommended by the authors.

External beam radiotherapy was well tolerated by the patients in this study. There was no severe side effect observed in any of the patients. Two point three percent of the patients had mild diarrhea and nausea. According to literature report, morbidity associated with palliative radiotherapy for bone metastases is low. The limitation of the study was the number of patients studied and this did not permit further detailed/elaborate statistical analysis. Also the lack of isotope bone scan in our centre limited the detailed evaluation of bone deposits.

It is the authors' opinion that breast cancer is the commonest cause of bone metastasis in the sub region. All patients with bone pains in a cancer setting or had previous surgery for cancer should be intensively evaluated and followed up. External beam irradiation using Cobalt 60 in a low resource setting is still adequate/effective for palliating pain in metastatic cancer patients.

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