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Research Article

APPRAISAL OF PAIN PATTERN AMONG PATIENTS WITH BONE METASTASIS ON TREATMENT WITH BISPHOSPHONATES AND PALLIATIVE RADIOTHERAPY

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ABSTRACT

Background: Bone is the most common site of metastasis in cancer**.** Bone metastasis is a devastating condition that can have a negative impact on the lives of patients with advanced cancer in many ways. Patients may experience limitations in the activities of daily living (ADL), decreases in quality of life (QOL) and threat of survival due to bone metastases. Although the overall incidence of bone metastasis (BM) is unknown, BMs are a frequent complication in patients with advanced cancer. Pain is among the most prevalent symptoms and poses a challenge for the cancer health-care system. **Aim:** To study the pain in patients with metastatic bone disease receiving Bisphosphonates and External Beam Radiation Therapy. **Methodology:** A Prospective observational study was carried out in Government General Hospital, Guntur for duration of 6months i.e., October 2017 to March 2018 after obtaining approval from Institutional Ethics Committee. The Patients were screened based on inclusion and exclusion criteria. Patients who satisfy inclusion criteria were included in the study after obtaining informed consent. The data was collected in the designed data collection form. Pain assessment was carried out by using part 1,3,4 of Mc gill pain questionnaire. Part 1 gives the information regarding "Where is your pain", part 3 gives information about the "factors affecting the pain" and part 4 "How strong the pain is". Visual analogue scale was used to assess pain through facial expressions (No pain, minor, moderate & severe pain). The obtained results were tabulated and interpreted using suitable statistical software (SPSS version 22.00, Paired t-test). **Results:** 36 patients who met the inclusion criteria were included in the study. On reviewing the demographic data it was found that bone metastasis was found to be more predominant in females within the age group of 51-70 years. Our study also revealed that there was no significant family history noted in patients who developed metastasis. In our current study it was found that patients suffering with breast cancer, lung cancer and prostate cancer are more likely to develop bone metastasis. We also tried to assess the pain status through Mc gill pain questionnaire and Visual analogue scale in patients who were receiving Bisphosphonates and EBRT (upto 10#, 30Gy). We noted that pain status gradually decreased ($P<0.0001$****) with increase in cycles of EBRT and Bisphosphonates therapy. **Conclusion:** Based on the results obtained our study *strongly concludes* that use of Bisphosphonates and EBRT is effective in reducing pain in patients with bone metastases.

INTRODUCTION

Cancer is a generic term for a large group of diseases that can affect any part of the body. One defining feature of cancer is the rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs, the latter process is referred to as metastasizing[1]. Metastases are a major cause of death from cancer. Bone is the most common site of metastasis in cancer. Bone metastasis is a devastating condition that can have a negative impact on the lives of patients with advanced cancer in many ways. The most common human cancers such as breast, prostate, kidney, thyroid and lung have a great avidity for bone, leading to painful skeletal symptoms. The distress associated with this symptom adds significantly to the overall burden for patients and their families. Pain is among the most prevalent symptoms and poses a challenge for the cancer

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health-care system. BMs can be associated with skeletal-related events (SREs), which include pathologic fracture, the need for surgery or radiation to bone, spinal cord compression, and hypercalcemia of malignancy (HCM)[2]. Palliative radiotherapy for bone metastases is of significant benefit to patients with painful bone metastasis and metastatic spinal cord compression. Radiotherapy plays an important role in palliative care and treatment for patients with symptomatic bone metastases. The World Health Organization recommendations for relief of cancer pain indicate that the severity of a patient's pain, rated on a scale of 1-10, will dictate what type of pain medication is used. For **Mild to Moderate Pain (1-3)** Non-opioids are the first choice of treatment for mild to moderate pain. This includes medication such as acetaminophen (Tylenol) or a non-steroidal anti-inflammatory drug (NSAID), such as ibuprofen. For **Moderate to Severe Pain (4-6)** Patients with moderate to severe pain who have not responded to the first step should receive an opioid. These medications may include codeine, hydrocodone, dilhydrocodiene, oxycodone, propoxyphene, and tramadol. Acetaminophen or a NSAID may be added. For **Severe Pain (7-10)** Patients with severe pain or patients whose pain has not been relieved by the previous recommendations will usually receive a stronger opioid. Opioids for severe pain may include morphine, oxycodone, hydromorphone, methadone, levophanol, or fentanyl. A non-opioid medication such as aspirin, acetaminophen, or ibuprofen may be added in some cases[3].

Aim: To study the pain pattern among patients with bone metastasis who were receiving bisphosphonates and palliative radiotherapy.

Objective

To assess the pain pattern in patients receiving Bisphosphonates & EBRT

METHODOLOGY

A non experimental prospective observational study was carried out on "Appraisal of Pain pattern among Patients with Bone metastasis on Treatment With Bisphosphonates and Palliative Therapy" for a period of 6 months from October 2017 to March 2018 in Government General Hospital, Guntur in the Department of Radiotherapy after obtaining approval from Institutional Ethics Committee. The Patients were screened based on inclusion and exclusion criteria. Inclusion criteria includes patients who are diagnosed malignancy with bone metastases, those receiving zoledronic acid and EBRT, Patients of either gender and age >21 yrs, those who are with performance status (ECOG) more than grade II, Patients who concerned to participate in the study, who are able to understand local language, who are willing for regular follow up. Exclusion criteria includes patients whose origin of cancer (primary lesion) involved is bone, those who are receiving bisphosphonates alone, receiving EBRT alone, who are not willing to participate in the study, who were renally impaired, those not willing for regular follow up, who are < 21 yrs of age, who are pregnant and lactating. Patients who satisfy inclusion criteria were included in the study after obtaining informed consent. The data was collected in the designed data collection form. After the necessary data was collected Assessment of Pain was carried out by using part 1,3,4 of Mc gill pain questionnaire. Part 1 gives the information regarding "Where is your pain", part 3 gives information about the "factors affecting the pain" and part 4 "How strong the pain is". Visual analogue scale was used to assess pain through facial expressions (No pain, minor, moderate & severe pain).The obtained results were tabulated and interpreted using Paired t-test in SPSS version 22.00.

RESULTS

Based on the results obtained our study revealed that patients with bone metastasis was found to be more predominant in females (58.34%) as shown in fig 1.

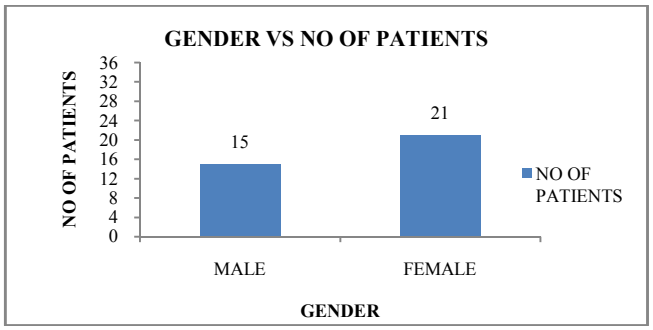

Figure 1 Gender VS no. of patients

Within the age group of 51-70 years (63.89%) as depicted in fig 2. Our study also found that there is no significant association (94.45%) with family history for the development of bone metastasis as shown in fig 3.

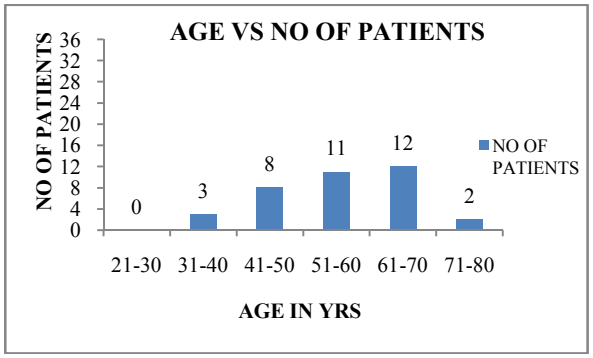

Figure 2 Age VS no. of patients

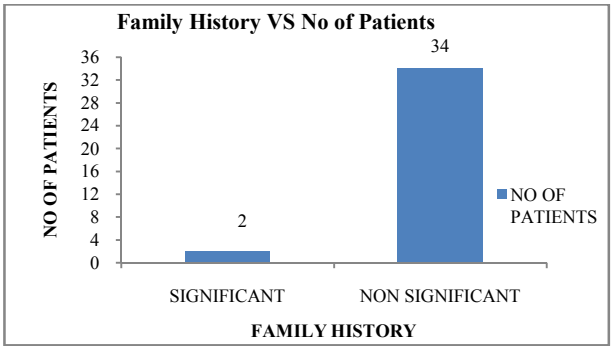

Figure 3 Family History VS No. of Patients

Our study also revealed that patients suffering with breast cancer (30.56%), Lung (19.44%), Prostate (16.67%) & multiple myeloma (3.89%) are more likely to develop bone metastasis followed by cervical(8.33%), endometrium (2.78%), Hepatocellular carcinoma (2.78%) and unknown origin (2.78%) as depicted in fig 4. Based on fig 5 we also noted that

multiple site metastases (80.56%) were found to be more common compared to single site (19.44%).

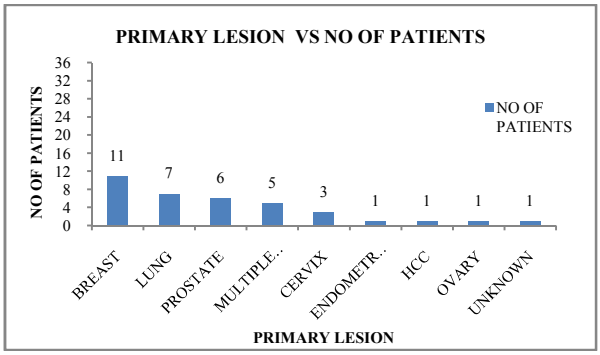

Figure 4 Primary Lesion VS no. of Patients

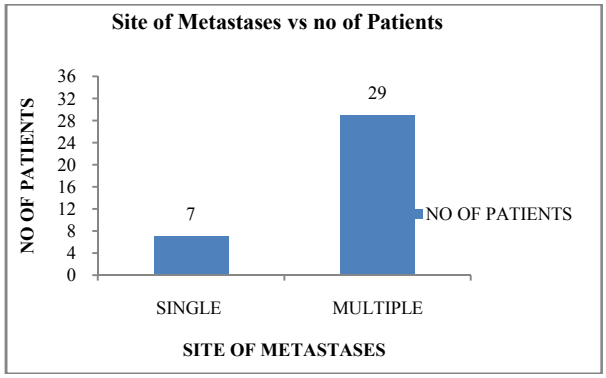

Figure 5 Type of Skeletal Metastasis VS No.of Patients

We also tried to analyze the most affected sites of metastasis and found that axial skeleton (44.45%) was mostly affected when compared to appendicular skeleton (16.67%) according to fig 6. Fig 7 depicts that in axial skeleton we also noted that Ribs (44.45%), Lumbar and Dorsal vertebrae(38.89%), Iliac bones (30.55%), Femur & Acetabulum (25%) & Sacrum (22.22%) are mainly affected followed by Pelvic Bones, Disc Regeneration, Clavicle, Sacroiliac & Tibia(5.55%), Radius, Thoracic Cage, Shoulder Joints & Wrist Joints(2.78%).

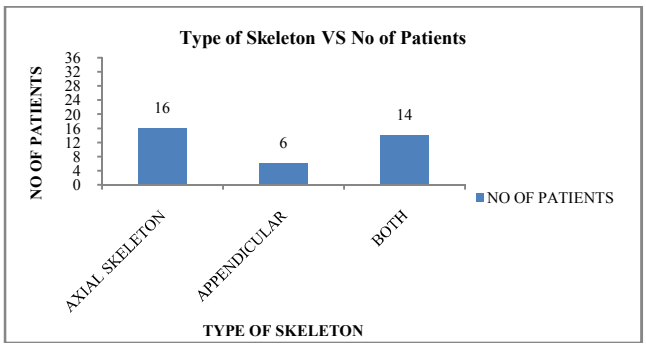

Figure 6 Type of Skeleton VS no. of Patients

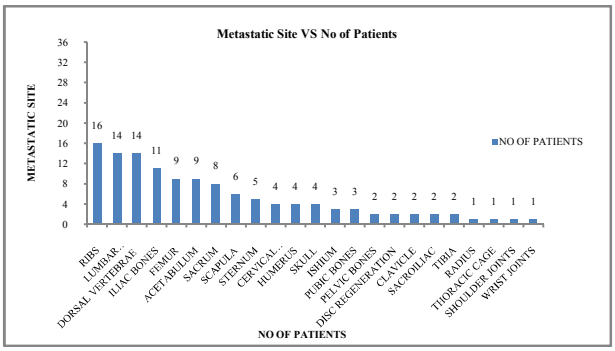

Figure 7 Metastatic Site VS no. of patients

Table 8 depicts the results of Visual Analogue Scale(VAS).On reviewing the data obtained it was found that most of the patients were suffering with moderate pain (66.66%), followed by severe pain (30.05%) and only 1 patient (2.78%) was experiencing minor pain before treatment with Bisphosphonates and EBRT. After the treatment patients experiencing severe pain was completely zero and with most of them have moderate pain (38.89%) followed by minor pain (33.34%) and No pain (2.78%).

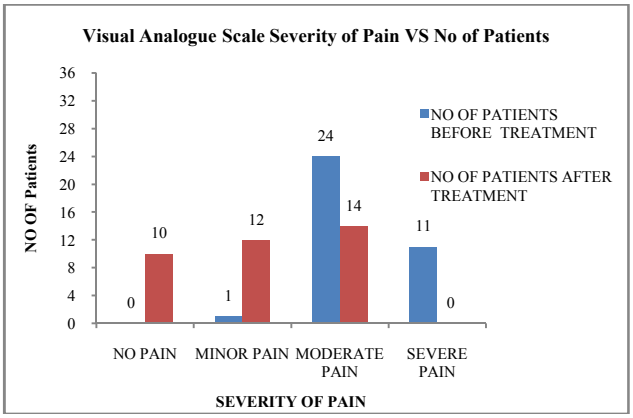

Figure 8 Severity of pain VS no. of patients

A p value (<0.0001****) was considered to be extremely significant

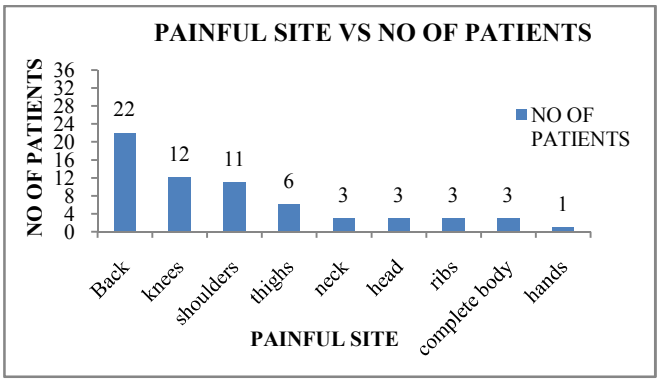

Figure 9 Site of Your Pain VS No. of Patients

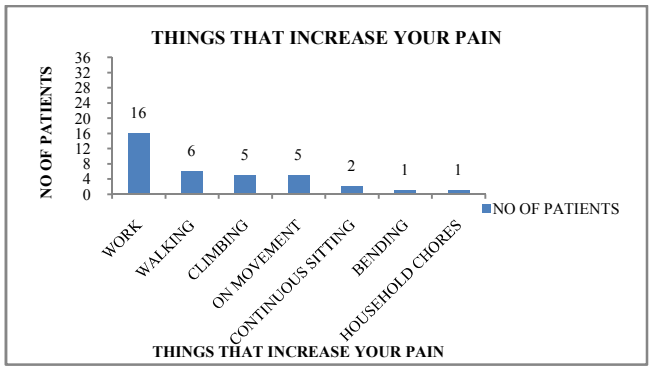

Figure 10 Things That Increase Your Pain VS No. of Patients

On assessing the results of part 1 of Mc Gill pain questionnaire as depicted in fig 9 it was clearly evident that most of the patients were experiencing pain at Back (61.12%), followed by Knees (33.34%), Shoulders (30.55%), Thighs (16.67%), Neck, Head, Ribs & Complete body (8.33%) and in Hands (2.78%). Part 3 of the questionnaire revealed according to fig 10 that in most of the patients, Work (44.44%) is the primary cause for increasing their pain followed by Walking (16.67%), Climbing & on Movement (13.89%), Continuous Sitting (5.55%) and finally Bending & doing Household Chores (2.77%).

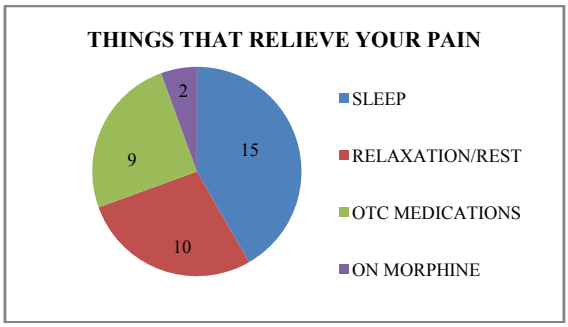

Figure 11 Things That Relieve Your Pain VS no. of Patients

Table 1 Pain Right Now VS no. of Patients

Which Word Describes Your Pain Right Now	No of Patients(N=36)		p value
	Before Treatment (n) (%)	After Treatment (n) (%)	
MILD	0	22 (61.12%)	<0.0001
Discomforting	8 (22.22%)	13 (36.11%)	
Distressing	10 (27.77%)	1 (2.77%)	
Horrible	14 (38.89%)	0	
Excruciating	4 (11.11%)	0	

A p value (<0.0001****) was considered to be extremely significant

Table 2 Pain At ITS Worst VS no. of Patients

Which Word Describes It At Its Worst	No of Patients(N=36) (n) (%)		p value
	Before Treatment	After Treatment	
MILD	0	23 (75)	<0.0001
Discomforting	12 (69.45)	10 (22.23)	
Distressing	9 (16.67)	3 (2.78)	
Horrible	9 (8.34)	0	
Excruciating	7 (5.56)	0	

A p value (<0.0001****) was considered to be extremely significant

Table 3 Pain at Its Least Vs no. of Patients

Which Word Describes When It Is Least	No of Patients(N=36) Treatment (n) (%)	Treatment (n) (%)	p value
MILD	3 (25)	27 (63.89)	<0.0001
Discomforting	25 (33.34)	8 (27.78)	
Distressing	2 (19.45)	1 (8.34)	
Horrible	6 (25)	0	
Excruciating	0	0	

A p value (<0.0001****) was considered to be extremely significant

On further analyzing the results of part 3 of the questionnaire as shown in fig 10 it depicts that Sleep (41.67%) is the most relaxing activity for most of the patients followed by Relaxation/Rest (27.77%), OTC Medications (25%) and on taking Morphine (5.55%).The results of Part 4 of Mc gill pain questionnaire as shown from table 1 to table 3 (pain at right now)indicates that most of the patients were experiencing horrible pain (38.89%), before the treatment followed by Distressing (27.77%), Discomforting (22.22%) & Excruciating pain (11.11%.After treatment most of them experienced Mild pain (61.12%) followed by Discomforting (36.11%) & Distressing pain (2.77%). The results of Part 4 of Mc gill pain questionnaire (pain at its worst) depicts that most of the patients were experiencing Discomforting pain (69.45%), before the treatment followed by Distressing (16.67%), Horrible (8.34%) & Excruciating pain (5.56%).After treatment most of them experienced Mild pain (75%) followed by Discomforting (22.23%) & Distressing pain(2.78%). The results of Part 4 of Mc gill pain questionnaire (pain at its least) reveals that most of the patients were Discomforting pain (33.34%), before the treatment followed by Horrible (25%), Mild (25%) &Distressing pain (19.45%).After treatment most of them experienced Mild pain(63.89%) followed by Discomforting (27.78%) & Distressing pain(8.34%).

DISCUSSION

A non experimental prospective observational study was carried out on "Appraisal of Pain pattern among Patients With Bone metastasis on treatment with Bisphosphonates And Palliative Therapy". 36 patients met the inclusion criteria and were included in the study. The data obtained was tabulated and analyzed. Based on the results obtained our study revealed that patients with bone metastasis was found to be more predominant in females (58.34%) within the age group of 51-70 years (63.89%). These findings were in concordance with study done by vivek ajit singh *et al*., (2014) on "Incidence and outcome of bone metastatic disease at University Malaya Medical Centre" which showed that the highest incidence of metastatic bone disease was observed in patients aged 50–59 years, followed by patients aged 60–79 years. Our study also found that there is no significant association (94.45%) with family history for the development of bone metastasis. Our study also revealed that patients suffering with breast cancer (30.56%),Lung (19.44%), Prostate (16.67%) & multiple myeloma(3.89%) are more likely to develop bone metastasis followed by cervical (8.33%), endometrium (2.78%), Hepatocellular carcinoma (2.78%) and unknown origin (2.78%) This findings were similar to the study done by vivek ajit singh *et al*., on " Incidence and outcome of bone metastatic disease at University Malaya Medical Centre" which showed that Breast cancer (23.2%) was the most common primary cancer, followed by lung (21.2%), prostate (9.3%) and thyroid (7.3%) cancers, and renal cell carcinoma (5.3%). The incidence of primary tumours of unknown origin was an infinitesimal 6.6%. We also noted

that multiple site metastases (80.56%) were found to be more common compared to single site (19.44%). We also tried to analyze the most affected sites of metastasis and found that axial skeleton (44.45%) was mostly affected when compared to appendicular skeleton (16.67%). In axial skeleton we also noted that Ribs (44.45%), Lumbar and Dorsal vertebrae(38.89%), Iliac bones(30.55%), Femur & Acetabulum (25%) & Sacrum(22.22%) are mainly affected followed by Pelvic Bones, Disc Regeneration, Clavicle, Sacroiliac & Tibia(5.55%), Radius, Thoracic Cage, Shoulder Joints & Wrist Joints(2.78%). These results were similar with study done by vivek ajit singh *et al*., on "Incidence and outcome of bone metastatic disease at University Malaya Medical Centre" which showed that Metastasis is more prevalent in the axial skeleton compared to the appendicular skeleton, due to a higher percentage of red bone marrow. We also tried to assess the pain status through Mc gill pain questionnaire and VAS in patients who were receiving bisphosphonates and EBRT. We noted that pain status gradually decreased (P<0.0001****) with increase in cycles of EBRT and bisphosphonates therapy. These results are similar with study done by Dah-cherng Yeh *et al*. (2014) on "EORTC QLQ-BM22 Quality of Evaluation and Pain Outcome in Patients with Bone Metastases from Breast Cancer Treated with Zoledronic acid" which stated that VAS scores indicated a significant reduction in pain over the course of the study compared to the baseline.

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