

# Effect of Radiotherapy on Painful Bone Metastases A Secondary Analysis of the NCIC Clinical Trials Group Symptom Control Trial SC.23

McDonald, R.(1), Ding, K.(2), Brundage M (3), Meyer RM (4), Nabid A (5), Chabot P (6), Coulombe G (7), Ahmed S (8), Kuk J (9), Dar AR (10), Mahmud A (11), Fairchild A (12), Wilson C (2), Wu JSY (13), Dennis K, DeAngelis C (1, 14), Wong RKS (15), Zhu L (2), Chan S (1), Wan BA(1)\*, Chow E (1)

1 Odette Cancer Centre- Sunnybrook Health Sciences Centre, Department of Radiation Oncology, Toronto; 2 Cancer Research Institute- Queen's University, Canadian Clinical Trials Group, Kingston; 3 Queen's University, Kingston; 4 Juravinski Hospital and Cancer Centre- McMaster, Hamilton; 5 Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke; 6 Hopital Maisonneuve-Rosemont, Montreal; 7 CHUM-Hopital Notre-Dame, Montreal; 8 CancerCareManitoba, Winnipeg; 9 Grand River Regional Cancer Centre, Grand River Hospital, Kitchener; 10 London Regional Cancer Program, London; 11 Cancer Centre of Southeastern Ontario, Kingston General Hospital, Kingston; 12 Cross Cancer Institute, Edmonton; 13 Tom Baker Cancer Centre, University of Calgary, Calgary; 14 Leslie Dan Faculty of Pharmacy, University of Toronto, Toronto; 13 University of Ottawa, Ottawa Hospital Research Institute, Ottawa; 15 Princess Margaret Hospital, Radiation Medicine Program, Ontario Cancer Institute, University of Toronto



## Introduction

- ❖ Radiotherapy is a key treatment modality for symptomatic uncomplicated bone metastases, with approximately 60-70% of patients experiencing benefit and 25-30% of patients achieving a complete response, independent of whether single or multiple fractions are prescribed
- ❖ Increased pain is associated with a lower quality of life (QOL) in patients with symptomatic bone metastases, thus a reduction in pain after radiotherapy should result in improvement in QOL
- ❖ Studies to date have demonstrated this hypothesis, but involve small patient populations, do not use specific QOL measurement tools for patients with bone metastases, evaluate response at various time points, and do not account for analgesics according to the current international consensus end point definitions

## Objective

To investigate determine whether there are differences in QOL between responders and nonresponders at days 10 and 42 post treatment, using the QLQ-C15-PAL, QLQ-BM22, and the International Bone Metastases Consensus Endpoint Definitions.

## Methods

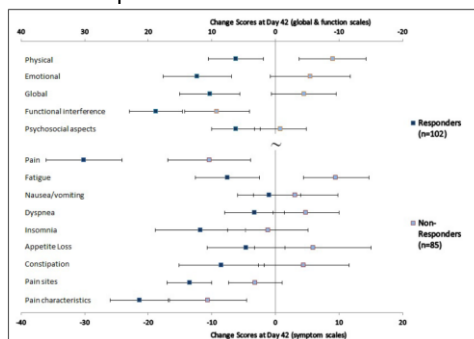
- ❖ This is a secondary analysis of the NCIC Clinical Trials Group Symptom Control Trial SC.23 (NCIC-CTG-SC.23)
- ❖ Patients were accrued from May 30, 2011 to December 11, 2014 and were followed up for 42 days post treatment
- ❖ All patients were prescribed single 8-Gy radiotherapy to 1 or 2 painful bone metastases
- ❖ Patients were randomized to receive two 4mg tablets of dexamethasone or 2 placebo tablets at least 1hr before radiotherapy, then every day for 4 days after radiotherapy
- ❖ Patients reported their worst pain score and daily opioid analgesic intake at baseline, days 1 to 10 after treatment, and day 42 after treatment; pain response was assessed with International Bone Metastases Consensus Endpoint Definitions
- ❖ Patient-reported QOL was evaluated using the QLQ-C15-PAL and QLQ-BM22 at baseline, and days 10 and 42 post treatment
- ❖ Clinically meaningful changes in QOL were those that differed by 10+ points from baseline

## Results

- ❖ A total of 298 patients were enrolled in the study
  - ❖ At days 10 and 42, 122 (40.9%) and 116 (38.9%) patients responded to radiotherapy
- ### DAY 10
- ❖ Patients with pain response reported improved physical functioning (P=.03), constipation (P=.02), and functional interference (P=.007) and less pain (P<.001), painful sites (P=.03) and pain characteristics (P<.001) and compared with nonresponders
  - ❖ The greatest difference observed was in the pain item of the QLQ-C15-PAL, where responder reported scores were a mean of 17.1 points lower than scores reported by nonresponders
  - ❖ Patients with pain response had significantly greater reduction in pain (mean reduction, 17.0 vs 1.8, P=.002) and pain characteristics (mean reduction, 12.8 vs 1.1, P=.002)
  - ❖ Patients with pain response had greater improvements in functional interference (mean increase, 11.6 vs 3.6, P=.01) and psychosocial aspects (mean increase, 1.2 in responders vs mean decrease of 2.2 in nonresponders, P=.04)
- ### DAY 42
- ❖ Patients with pain response reported significantly greater improvements in all domains/items of the QLQ-C15-PAL and QLQ-BM22 except for dyspnea (P=.06), insomnia (P=.09), and psychosocial aspects (P=.07)
  - ❖ In terms of changes in QOL from baseline to day 42, responders had significantly greater improvements in the physical (mean increase, 6.2 vs -9.0, P<.001), emotional (mean increase, 12.3 vs -5.5, P<.001), and global domains (mean increase, 10.3 vs -4.5, P<.001) of the QLQ-C15-PAL compared with nonresponders

Figure 1. Change in Mean QOL Scores at Day 42 for Responders vs Nonresponders

Error bars indicate 95% CI. Change scores to left of vertical reference line denote improvement.



## Discussion

- ❖ Day 42 results of our study confirm previous findings that a greater proportion of those who have a pain response after radiotherapy will also have a clinically meaningful response in many domains of QOL
- ❖ Because the main purpose of radiotherapy was pain relief, the most significantly improved QOL outcomes in the present study were pain-related outcomes, such as pain characteristics, number of painful sites, and functional interference
- ❖ QOL items that were not expected to improve with pain reduction, including dyspnea and insomnia, did not significantly improve in responders; thus, physicians should use other more appropriate treatment modalities to address these symptoms separately

## Conclusion

- ❖ 40% of patients experienced pain reduction and better QOL at day 10 after radiotherapy, with further improvements in QOL at day 42 in responders
- ❖ A single 8-Gy radiotherapy dose for bone metastases should be offered to all patients, even those with poor survival
- ❖ Our evaluation time points (days 10 and 42) should be used in future studies that involve similar patient populations because they are more relevant than evaluating those with poor expected survival at 2 or even 3 months after treatment.

**Select References:**  
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