An Audit of Current Practice and Management of Metastatic Spinal Cord Compression at a Regional Cancer Centre

Abstract:

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Metastatic spinal cord compression (MSCC) is an oncological emergency requiring prompt recognition and management to preserve neurological function and mobility. We performed an audit to assess current practice of MSCC against current best practice as outlined by NICE. Our retrospective audit identified 10 patients from January to December 2009 with confirmed MSCC. The most common primary tumours were prostate (30%), breast (30%) and lung (20%). Pain was the main presenting symptom (90%), followed by weakness (70%) and sensory changes (10%). 5 patients had MRI within 24 hours and only 6 (60%) underwent full MRI scan. 8 (80%) had corticosteroids before MRI scan. 6 (60%) received radiotherapy within 24 hours. Only 4 (40%) were referred to orthopaedics and none of these patients had been recommended surgery. Up to 14 days following radiological confirmation of MSCC, the number of patients who were unable to walk increased by 20%. Only 5 (50%) were discharged during this period of study. Our audit reported a number of variances in management compared to NICE guideline. These can be improved by following a fast track referral pathway and regular education for junior doctors and primary care doctors.

Introduction

Metastatic malignant spinal cord compression (MSCC) is defined as spinal cord or cauda equina compression by direct pressure and/or induction of vertebral collapse by metastatic spread or direct extension of malignancy that threatens neurological disability. MSCC is a common oncological emergency that requires prompt recognition and immediate treatment to relieve pain and preserve neurological function. It is thought to affect more than 4000 people each year in the United Kingdom. Approximately 5-10% of patients with cancer go on to develop malignant spinal cord compression. The effect of MSCC can range from minor sensory, motor and autonomic changes to severe pain and complete paralysis that significantly affects patients quality of life. If left untreated, it can cause irreversible neurological damage and paraplegia. Almost 50% of patients are unable to walk by the time of diagnosis. Once paraplegia develops, improvement in function is not usually achievable.

Recognition is difficult as non-specific back pain is common in both the general population and patients with cancer. In addition, 23% of patients with spinal metastasis have no prior cancer diagnosis. The aim of this audit was to assess current practice and management of metastatic spinal cord compression in Waterford Regional Hospital, a regional cancer centre for the South East of Ireland, against current best practice as outlined by National Institute for Health and Clinical Excellence (NICE).

Methods

This retrospective audit identified patients with a diagnosis of metastatic spinal cord compression referred from Waterford Regional Hospital to Whitleford Clinic (Radiotherapy Centre) from January 2009 to December 2009. Medical notes were reviewed. Inclusion criteria included those with a definite diagnosis of MSCC and who were also in-patients in Waterford Regional Hospital. Patients were excluded if they were not in-patients and those with impending spinal cord compression. A total of 18 patients were identified. Only 10 patients were included. 6 patients were excluded; 3 were in-patients in peripheral hospitals, 2 were in-patients in private setting, 2 had impending spinal cord compression and 1 had vertebral collapse. We used Microsoft Word to collect all data.
Results

Diagnosis and symptoms
We had 10 patients from January 2009 to December 2009; 6 were females and 4 were males. The mean age was 73.5 years (Table 1). The most common primary cancers were prostate (30%), breast (30%) and lung (20%). Multiple myeloma and urothelial tumours accounted for the other 20%. Bone was the most common site of metastasis and this occurred in 90% of patients. Pain was the main presenting symptom (90%) followed by weakness of the limbs (70%). Only 10% had sensory changes.

Radiological investigations
All patients had an MRI to confirm diagnosis. 50% of these patients had MRI within 24 hours from clinical suspicion (Figure 1). 20% of patients had scan in 24 to 48 hours and 30% were scanned after 72 hours. All scans took place during weekdays. Only 60% underwent full MRI spine. The thoracic spine was the most common site involved (60%) followed by lumbar spine (50%). 20% of patients were identified as having MSCC in more than one area of the spine.

Steroid therapy
In 80% of patients steroids were administered before MRI. All patients received at least 16mg dexamethasone. Steroids were reduced in less than 5 days after commencing radiotherapy in 7 patients. 90% patients were on oral proton pump inhibitors. All had blood sugar checked. No documentation of oral candidiasis found.

Radiotherapy
All of the patients with MSCC received palliative radiotherapy. Six patients (60%) received radiotherapy within 24 hours of confirmation. Figure 2 demonstrates time interval between MRI spine and starting radiotherapy.

Figure 1: Time interval between clinical suspicion and MRI

Figure 2: Time interval between MRI spine and starting radiotherapy

Orthopaedics review
Only 40% of patients were referred to orthopaedics service mainly for surgical opinion. All these referral were made to local service which does not specialize in spinal surgery. Only 10% referral was made within 24 to 48 hours after scan. Despite referral, recommendation on brace and mobilization remained low at 20% and 30% respectively. Surgery was not recommended for any patient.

Figure 3: Ambulatory status on admission and up to 14 days after radiological confirmation

Nursing care
In our centre, there is no clear consensus as to when a patient is safe to mobilize. We found that 90% of patients were not nursed flat at initial stage and were allowed to mobilize as tolerated. Assessment of pressure ulcers only took place in 40% of patients. Prophylactic anticoagulant was prescribed in 80% of patients. A total of 50% had urinary catheters and 70% were on laxatives.

Functional outcome in mobility, pain and weakness
At time of admission, only 20% of patients were walking independently, 70% with walking aid (including walking aid or with assistance) and 10% were unable to walk. A week to 14 days following radiological confirmation, mobility was reassessed again. These were taken from either medical notes, nursing notes or physiotherapists notes. After treatment, 20% remained walking independently, 50% walking with aid and 30% were unable to walk (Figure 3). In terms of weakness, 30% reported improvement, 20% had no changes and 10% deteriorated. Pain control improved in 80% of patients and deteriorated in 10%.
Discharge location
The discharge location was assessed up to 14 days following radiological confirmation. Only 3 patients went home during this period. Another 2 patients were transferred back to referring hospitals. 3 patients continued to stay as in-patients and eventually died in our hospital (2 patients died after 1 month and 1 patient died after 3 months). One death recorded during the 14 days following radiological confirmation. Another patient self discharged against medical advice during this period of study.

Discussion
Our audit reported a number of variances in the multidisciplinary management of metastatic spinal cord compression (MSCC) compared to the guideline outlined by NICE. In our audit a high incidence of primary cancers of prostate, lung and breast was found. This is consistent with current reported literature where these patients account for more than 50% of MSCC cases. Back pain is a common complaint as evident by 90% of patients in the study. This is followed by weakness in 70%. About 80% of them had symptoms of at least a week before detection. It is therefore important to highlight the value of recognising unremitting back pain in those with known malignancy (especially those from prostate, breast or lung cancer) and the need for prompt referral for management of MSCC. Prevention of potential irreversible neurological deficits could be improved if cancer patients were taught the importance of contacting health care providers when there is persisting back pain and especially if pain is accompanied by neurological symptoms and signs.

Only 50% patients underwent MRI spine within 24 hours of clinical suspicion as suggested by NICE guideline. Significant delay of more than 72 hours occurred in 30% of patients. This was due to unavailability of weekend service in our hospital and delay in patient transfer from peripheral hospital. Despite 20% having more than one area of spine involved in MSCC, only 80% had MRI full spine. A MRI of entire spine is necessary because simultaneous occult disease is not unusual in patients with spinal cord compression. Also, localisation of the pain does not always correspond to the site of compression.

The NICE guideline has recommended commencing radiotherapy within 24 hours of confirming a MSCC if surgery is not suitable. 60% of patients were given treatment within this period of time. 30% had radiotherapy after the recommended time frame (> 72 hours of MRI scan) due to diagnosis being made immediately prior to the weekend and self discharge against medical advice. The surgical referral rate was low at 40% with no patients undergoing surgery. The reason for this is unclear and needs to be addressed promptly. In a prospective study by Patchell et al (2005) patients who received surgery (within 24 hours of presentation) followed by radiotherapy retained the ability to walk significantly longer than those treated with radiotherapy alone. Maintenance of continence, functional scores and survival were also significantly greater in groups randomized to surgery before radiotherapy. Steroids are routinely given to those with MSCC as they are believed to reduce tumour bulk and relieve spinal cord pressure. Patients should be started on steroid on clinical grounds without waiting for radiological confirmation. The dose recommended by NICE is at least 16mg daily with proton pump inhibitor cover. 80% of our patients were on steroid before radiological confirmation. Despite risk of GI bleed or perforation from the high dose of steroid, about 10% of our patients were not on proton pump inhibitor or antacids.

Nursing care in terms of bed rest versus mobilization remains unclear in our centre. In the past, mobilization has usually only been started after radiotherapy or spinal stabilization. However, there is no research evidence to support any of these approaches. The NICE guideline stated that for those with MSCC, patients should be nursed flat with frequent log rolling checking for pressure ulcers until neurological stability is ensured. While it is not possible to confirm spinal stability solely from MRI, CT and plain X-Ray in conjunction with MRI may indicate that the spine is not at immediate risk from instability. This will allow gradual mobilization. However if neurological symptoms or pain occur while on gradual mobilization, patients should return to a position where these changes reverse. As not many are fully aware of this guideline, the compliance rate for nursing flat was only 10% in our audit. Bowel and bladder involvement in MSCC with advanced autonomic dysfunction carry a poor prognosis. About half of our patients needed a urinary catheter suggesting a significant impact of MSCC on urinary incontinence or retention. A high percentage of patients (70%) was also on laxatives either directly due to MSCC, to opioid use or reduced mobility. Thromboembolic event is also higher in this group of patients due to immobilization. Low molecular weight heparin is recommended. 80% of our patients had low molecular weight heparin prescribed.
Levack et al (2001) suggest that the ability to walk at the time of diagnosis is a statistically significant predictor of outcome in terms of survival. Figures of independent ambulatory status in our audit (20%) are similar to those reported by Levack (2001) at the time of diagnosis of MSCC. This proves patients are still diagnosed at late stage of MSCC. 40% of patients subsequently died in our centre within 3 months. Retrospective and prospective observational studies demonstrate that median survival for patients who could walk after completion of therapy was 7.9 to 9 months but median survival for non-ambulatory patients was only 1-2 months.

This audit identifies areas of clinical practice which could be significantly improved. A fast track referral pathway is needed to ensure MSCC is diagnosed earlier and that treatment is commenced more promptly. Education for non-consultant doctors and primary care doctors should be scheduled regularly. It must be remembered that the burden from irreversible neurological impairment is significant both in terms of psychological and physical distress to patients and carers. There is also a significant impact on health care costs as a consequence of increased nursing needs and reduced independence.

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References