Motor Recovery Pharmacological Agents in Spinal Cord Injury Rehabilitation

Authors:
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Topic
1st choice: SCI

Case Diagnosis
C5 ASIA C secondary to gun shot wound

Case Description
Mr. A is a 19 year old male who presented with tetraplegia after suffering a gun shot wound resulting in a C6 burst fracture, thyroid injury, and esophageal tear. His goal for discharge was to regain his independence, walk again, and hopefully return to his job as a welder. Mr. A initiated gait training in therapy approximately fifty days post-SCI and walked 96.56 meters in 12 minutes with 3 breaks at a total assistance functional level for body weight support. Approximately 100 days post-SCI, he joined a double-blinded, randomized, cross over clinical trial that attempts to accelerate motor recovery using selective SHT reuptake inhibitor (SSRI) and tizanidine (TIZ) administration in combination with locomotor training early post-SCI (45-300 days). Mr. A was administered escitalopram oxalate 10mg (Lexapro®) before each training session. Over the course of four sessions, he increased his 10-meter walk test gait speed from 0.43m/sec to 0.61m/sec and six-minute walk test from 141.12 meters to 156.36 meters using a rolling walker. Mr. A was discharged prior to completing the clinical trial at a modified independence functional status for locomotion on level surfaces.

Discussions
Preliminary data has revealed that eight weeks of locomotor training with repeated SSRI administration has significantly improved treadmill-walking velocity compared to placebo in chronic SCI patients. The study Mr. A joined investigates an alternative method of pharmacological intervention that may improve locomotor recovery following incomplete SCI. Since Mr. A did not complete his trial, the gains he made are most likely contributed to his spontaneous recovery and daily individual therapy. Nevertheless, medications to accelerate motor function post-SCI by maximizing neuroplastic changes may provide an innovative remedy to rehabilitating a tragically affected population.

Conclusions
This case demonstrates the necessity to find dynamic and innovative solutions to speeding locomotor function for SCI patients. Physical interventions to improve locomotor recovery are well established and it has become important to find medicine to aid in improving the SCI rehabilitation process.
Authors:
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**Topic**
1st choice: SCI
2nd choice: Multiple Sclerosis and other Neurological Conditions

**Case Diagnosis**
Incomplete paraplegia resulting from chemotherapy-induced neurotoxicity.

**Case Description**
A 37 year-old male presented with a history of acute lymphoblastic leukemia with relapse following hyperCVAD + nelarabine chemotherapy. His course was complicated by ascending sensory loss and weakness to hip level, requiring him to ambulate with a walker. He underwent myeloablative haploidentical bone marrow transplant, soon after which he developed incomplete paraplegia with evidence of transverse myelitis on MRI. The patient was admitted to acute inpatient rehabilitation for management. While undergoing spinal cord rehabilitation, his course was complicated by hemorrhagic cystitis, neurogenic bladder and bowel, neutropenic fevers, and hyponatremia, which required him to be transferred back to oncology. He was stabilized and discharged to outpatient spinal cord rehabilitation.

**Discussions**
Neurotoxicity is a major side effect of chemotherapy, and the cumulative administration of nelarabine has been implicated as a causative agent in clinical trials and several recent case reports. Due to the background of patients with chemotherapy-induced paraplegia, it is important to manage secondary complications. This patient suffered many side effects related to his bone marrow transplant and chemotherapy course (hemorrhagic cystitis, neutropenic fevers, renal damage). Other medical issues, such as prophylactic treatment for prevention of deep vein thrombosis and management of neurogenic bowel and bladder, are also important points of care. This patient has long-term goals of being modified independent in his activities of daily living and at wheelchair level ambulation.

**Conclusions**
Patients with chemotherapy-induced spinal cord injury must have their secondary medical issues closely monitored and cared for prior to effectively undergoing acute inpatient rehabilitation. A diagnosis of incomplete paraplegia may lead to positive functional outcomes, but secondary issues may limit achievable goals.

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**ABSTRACT ID: 55006**
Common Pitfalls of Managing Patients with Concurrent Spinal Cord Injury and Traumatic Brain Injury

Authors:
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Thomas McNalley, MD, MA
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Topic
1st choice: TBI
2nd choice: SCI

Case Diagnosis
Compound injury: Spinal Cord Injury (SCI) and Traumatic Brain Injury (TBI)

Case Description
A 42 yo male diagnosed with C4 AIS D tetraplegia after extensive neurological history consisting of SCI and multiple TBIs was admitted to SCI unit for initial evaluation. Speech and psychology evaluations were notable for cognitive and behavioral deficits which included memory, attention, and concentration deficits, mild aphasia, and slight depression in mood. Accommodations for his neurological deficits were made to his SCI treatment plan across all the therapy disciplines in order to maximize his progress. Patient completed rehabilitation stay with no issues and discharged to his home after ten days. Further neuropsychology evaluation and counseling was recommended.

Discussions
Studies have shown that 60% of SCI patients have concurrent TBI. The rehabilitation care for patients with combined SCI and TBI is challenging to manage. Neurologic symptoms that accompany TBI can negatively impact a patient’s ability to participate in therapy, given the intensive nature of SCI rehabilitation. It is therefore important that rehabilitation teams are not only aware of the high incidence of compound injury, but also adjust therapy plans and goals to accommodate cognitive and behavioral deficits. Critical steps rehabilitation physicians should take include the following: ordering cognitive evaluation early in treatment, restructuring therapy plans to accommodate patient’s needs, encouraging family member or caregiver involvement, and maintaining a consistent primary team. These steps will allow the patient to progress through their therapy regimen more efficiently and with fewer complications.

Conclusions
Spinal cord injury patients with concurrent traumatic brain injury must be thoroughly evaluated and given accommodations in order to maximize progress through rehabilitation plan.

ABSTRACT ID: 52018
SEVERE PRESSURE ULCER FOLLOWING AN ACUTE DEPRESSIVE EPISODE IN A PATIENT WITH SPINAL CORD INJURY

Authors:
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Topic
1st choice: SCI
2nd choice: Reference Info

Case Diagnosis
Stage IV pressure ulcer in a patient with spinal cord injury (SCI) and untreated bipolar disorder.
Case Description
A 39-year-old community-dwelling man with significant medical history of incomplete cervical SCI, spasticity, depression, and bipolar I disorder presented with the chief complaint of a need for mobility device evaluation. Only upon screening did the patient divulge that he had developed wounds on his upper lateral thighs. Additional history revealed that he had discontinued his medication for bipolar disorder, became depressed, and spent significant time lying in bed. The patient had not sought professional treatment for his wounds. Instead, he had been packing the wounds with cotton balls covered with antibiotic ointment and was taking doxycycline that had been prescribed for a prior urinary tract infection. He was waiting to raise this issue at his outpatient SCI clinic appointment in two weeks. On physical examination, a Stage IV 1x1x2 cm wound was noted over the left greater trochanter with exposed bone, active drainage of purulent material, and surrounding erythema. The patient was sent to the Emergency Department for wound treatment. He was seen by plastic surgery and surgical debridement was required.

Discussions
It appears that the development of a severe pressure ulcer was caused by an acute depressive episode resulting from non-adherence to medication for bipolar disorder. Adding to the limited literature available on the topic, this report sheds light on the possible relationship between depression and pressure ulcers in people with SCI. Psychiatric conditions, particularly bipolar disorder and depression, should be considered as risk factors for pressure ulcers due to their clinical features of decreased activity level and reduced self-care. It is important to proactively screen for pressure ulcers, especially in patients with multiple risk factors.

Conclusions
Bipolar disorder and depression should be considered as risk factors for developing pressure ulcers in people with SCI.