Baclofen use in the treatment of spasticity and abnormal muscle tone

Individuals with traumatic brain injury (TBI) have multiple symptoms and limitations depending on their individual injuries. Due to their close relation with baclofen, some of the symptoms discussed in this article are spasticity and abnormal muscle tone.

Spasticity is a neurological issue which can impact muscles. It is characterized by tight or stiff muscles that may interfere with voluntary muscle movements. It is important to understand spasticity because it is not a dormant symptom of a neurological condition and limited to muscles. Coordinated smooth movements in an entire limb, trunk, one side of the body or sometimes the whole body depending on the type of injury/condition are impaired.

Spasticity can lead to immobility and eventually disability. It is usually caused by an imbalance of electrical signals coming from the spinal cord through the nerves to the muscles. This imbalance causes the muscle to become hyperactive, resulting in involuntary spasms. (“Multiple Sclerosis and Baclofen Therapy,” 2012)

According to O’Sullivan and Schmitz (2007), individuals with TBI often present with abnormalities in muscle tone. One study reported that among individuals with TBI who are undergoing in-patient rehabilitation, up to 84% developed contractures due to abnormal tone and spasticity. Increased tone may have beneficial and detrimental effects. Increased tone may make personal hygiene difficult, can lead to contractures and pressure sores, and be painful to the individual. Full body spasms may interfere with transfers.

In other instances, increased tone may help improve function. An increase in lower extremity tone may allow an individual to bear enough weight through the lower extremities to facilitate an independent bed transfer or make the transfer easier for a caregiver.

The foundations of spasticity management are therapeutic stretching of contracted muscles with abnormal tone and strengthening of the opposite lengthened muscles to allow for balance. This allows for the alignment of the limb as well as the rest of the body at rest and during motion (e.g., during transfers, standing, sitting and walking.)

Various medications may also be used to help reduce spasms and increased muscle tone; one of these is baclofen.

Baclofen is used to help with relaxation of muscles in the body by decreasing spasticity. It relieves the spasms, cramping and tightness of muscles caused by multiple sclerosis, traumatic brain injury, spinal cord injury, stroke and other neurological conditions.

Baclofen can be taken orally or delivered directly into the intrathecal space (located between the pia mater and arachnoid mater of the spinal cord) containing the cerebrospinal fluid (fluid surrounding the spinal cord and nerve roots). Oral baclofen can cause side effects that might limit its usefulness. When oral baclofen is delivered throughout the body, only a small portion goes to the spinal fluid where it is needed. An intrathecal delivery system, which provides the baclofen to the target site in the spinal cord, is a more effective way to deliver the medicine.

Anyone who has spasticity and is not responsive to oral baclofen is a candidate for intrathecal baclofen therapy, but it is said to be more effective for spasticity involving the legs as opposed to the arms. (“Multiple Sclerosis and Baclofen Therapy,” 2012)

O’Sullivan and Schmitz say the decision to use oral baclofen
What is a baclofen pump?

The baclofen pump system is the intrathecal (directly into the spinal fluid) method of delivering the medicine. The system consists of a catheter (a small, flexible tube) and a pump. The pump (a round metal disc about one inch thick and three inches in diameter) is surgically placed under the skin of the abdomen near the waistline. The pump stores and releases prescribed amounts of medicine through the catheter. The pump is refilled by inserting a needle through the skin into a filling port in the center of the pump. With a programmable pump, a tiny motor moves the medicine from the pump reservoir through the catheter. Using an external programmer, your treatment team can make adjustments in the dose, rate, and timing of the medicine. ("Multiple Sclerosis and Baclofen Therapy," 2012)

versus intrathecal baclofen pump is usually made by the patient and their entire treatment team which includes a physiatrist, physical therapist, occupational therapist, nurse and social worker. The team works together to provide a comprehensive evaluation of the patient’s spasticity symptoms to establish a treatment plan adapted to the patient’s needs. It is imperative that the treatment team works together to figure out the appropriateness of a baclofen pump for an individual. The decision criteria may include the level of spasticity, areas of body involved, how the spasticity affects mobility, and if the abnormal tone is being used to aid with daily mobility or not. Along with the above mentioned criteria, other considerations may include level of functioning, other related medical conditions, tolerance for surgery and follow up invasive procedures, and how much the possible reduction in spasticity may help with improving function or quality of life.

We have worked with several clients who have received oral baclofen or the baclofen pump to work on improvement in their tone and spasticity. The general consensus among therapists is that each patient goes through a series of adjustments to come to a therapeutic dose where the side effects are minimal and the tone reduction is the most optimal. Obtaining the optimal dose is a process with input (including objective measures like range of motion and mobility factors) gathered from the therapy team, family and patient to present to the physician. In certain cases botulism injections to specific muscle groups may also be added.

It can be said from a therapeutic perspective that baclofen is a modality that can be used in conjunction with other tone reduction modalities for patients with traumatic brain injury with prognosis depending on the patient’s injury and other contributing factors.

References:

By: Payal Desai, PT, NDTC, CBIS, CKTP
Rainbow Rehabilitation Centers

Copyright March 2013 – Rainbow Rehabilitation Centers, Inc.
All rights reserved. Printed in the United States of America.
No part of this publication may be reproduced in any manner whatsoever without written permission from Rainbow Rehabilitation Centers, Inc. For information, contact the editor at:
RainbowVisions Magazine
Rainbow Rehabilitation Centers, Inc.
38777 Six Mile Rd., Suite 101, Livonia, MI 48152 USA
E-mail: rainbowvisions@rainbowrehab.com