Alex Baker

ENG201 (TR-1:25)

April 24, 2013

MLA

A Day in the Life:

Living with Cerebral Palsy

Cerebral palsy (CP) is the most common disability that affects the physicality of children (Vargus-Adams and Martin). CP is a group of disorders that can involve brain and nervous system functions such as movement, learning, hearing, seeing and thinking, and it is caused by injuries or abnormalities of the brain (Hoch). Most of the complications that lead to CP occur while a baby is still in the womb, but they can also arise any time during the first two years of life when the child’s brain is developing. There are many different types of CP and variable symptoms which can make it hard to diagnose, but the prognosis is good, and there are many studies being done to find more concrete causes and a cure. Even though CP can lead to many difficulties in life, there are many steps that patients can take to ensure their lives are as easy as possible.

There are many diverse symptoms of CP which can make it hard to diagnose and treat. Symptoms include variations in muscle tone, lack of muscle coordination, tremors, writhing movement, favoring one side of the body, difficulty with fine motor skills, excessive drooling, and difficulty walking, swallowing, eating or speaking (Mayo). A patient can have any variety of these symptoms and each symptom can also differ in intensity depending on the person. Some children with CP can have delays in major milestones. For example, if a child is more than two months old and has difficulty controlling their head when picked up or if a child is more than twelve months and cannot crawl or stand by themselves, that could be a sign of CP because it means their muscles are not working correctly (Birth Defects). A patient could have decreased intelligence or learning disabilities but their intelligence could also be normal; again, it depends on the person and the intensity of the CP (Hoch).

When deciding on treatment options for patients with CP, it needs to be a collaborative effort between patients, doctors and parents if the patient is a child. Cooley mentions that because of “the diversity of individuals with CP together with the range of severity and complications makes this condition a challenge for health care systems”, which can be seen in the list of specialists that a patient may need to consult with throughout their life. The team of doctors overlooking treatment may include, but is not limited to, an occupational therapist, physical therapist, nutritionist, ophthalmologist, pediatrician to prescribe medications and orthopedic or general surgeon (Cooley). Some areas of function that patients want to expand upon are increasing strength, learning new skills such as writing, using assistive technology and changing gait pattern, while doctors are more concerned with lessening pain and enhancing motor function (Vargus-Adams and Martin), which can all be worked on with help from the above medical professionals.

The most important aspect of treatment for CP patients is therapy, both occupational and physical. Many of the symptoms of CP involve muscle tone where muscles can be too floppy or too stiff which can make precise movements very difficult, such as picking up silverware or toys (Mayo). Occupational therapy, which is defined as “therapy based on engagement in meaningful activities of daily life (as self-care skills, education, work, or social interaction) especially to enable or encourage participation in such activities despite impairments or limitations in physical or mental functioning” (Merrian-Webster), can help CP patients complete everyday activities that may normally be challenging for them. One practice in occupational therapy is constraint-induced therapy (CIT) which involves restraining the patients less affected limb, usually an arm, so the more affected arm can receive functional training (Wu et al). This can be extremely helpful because when one arm is “tied behind your back”, you learn to use the other arm much better. Wu et al conducted a study with eight children who all received CIT for four weeks, and at the conclusion of the study, they found that the children showed an improvement in fine motor skills and were better able to function in daily activities. Chen et al conducted a similar study with forty-seven children, half of whom were in the CIT group and the other half were in a traditional therapy group, and their results showed that the children in the CIT group had much better grasping ability and could more easily use the more affected arm. This information demonstrates that constraint-induced occupational therapy can greatly improve the ease in which CP patients can complete daily activities and they may be able to take part in more desired activities (Chen et al). Occupational therapy plays an important part in making sure CP patients can function in society and everyday life.

Along with occupational therapy, physical therapy is also very important. Physical therapy, which is defined as “the treatment of disease, injury, or disability by physical and mechanical means (as massage, regulated exercise, water, light, heat, and electricity)” (Merriam-Webster), can help CP patients have greater mobility, and is different than occupational therapy in that it works on gross motor skills such as walking, standing and moving the arms. According to Bryant et al, CP patients that cannot walk by themselves are more likely to have muscle weakness which can lead to pain and loss of function, which is why, as Mayston explains, a physical therapists job has changed over the years; where it was once more important to maintain a patient’s splints, which are devices used to support the weakened muscles, now the therapists put on greater focus on adjusting the muscle tone. One method to modify muscle tone and decrease weakness was utilized by Bryant et al who conducted a study on children with cerebral palsy that involved them in a six-week exercise program. The study included one group of children who used a static bike and a second group who used a treadmill, and they found that both groups showed improvement in motor functions compared to the control group who received their usual care (Bryant et al). Both exercise groups also developed an increased ability to exercise, such as greater time and speed, which proves that daily exercise can greatly decrease muscle weakness and improve function (Bryant et al). Another type of physical therapy that can be performed is motor learning coaching, which Bar-Haim et al defines as “the acquisition of new skills with practice”. In their study, Bar-Haim et al practiced a specific goal, such as climbing stairs or riding a bike, with children three times a week for three months to see if this repetitive practice could ‘teach’ their muscles how to act, and they found that motor functions are greatly improved after motor learning coaching, and that the children had greater mobility overall. Both types of therapy, occupational and physical, are necessary to give patients more independence in their day to day lives.

A second very important aspect of living with cerebral palsy is having physical aids to help with daily life such as glasses, hearing aids or walkers and wheelchairs. According to the Center for Disease Control (CDC), 59% of children with CP also have a second developmental disorder including hearing loss, 9%, and vision impairment, 15.7%. As with any vision or hearing loss, glasses and hearing aids can be used to improve function. An ophthalmologist would be needed to consult if there was a vision problem. As mentioned above, all types of CP have muscular dysfunction, whether it is muscles that are too stiff or too floppy, and this can make it very difficult to walk. Therefore, a supporting device can be used such as a walker, for people who have some mobility or a wheelchair, for those who have no mobility. Patients may also need a nutritionist or dietician because many people with CP can have trouble chewing or swallowing which means they do not get adequate nutrition (Cooley). If a patient has muscle spasms in their jaw or throat, it can make eating nearly impossible which could result in malnourishment. According to Cooley, about 50% of people with CP do not have proper nutrition, so a dietician or nutritionist would be necessary to plan a diet that would best work for the patient to keep them nourished and healthy.

A third aspect of treatment is prescription medication. While there are no medications to cure or eliminate all of the symptoms of CP, some medications can make life easier. Many patients try oral medications like diazepam or clonazepam which can cause muscle relaxation (Cooley). If oral medications do not work, patients can get medicine by injection, and one of the most used injections to treat CP is baclofen. Muscle twitches and jerk associated with CP are caused by excessive firing of neurotransmitters which makes muscles contract for no reason, but baclofen inhibits the release of these neurotransmitters so spasticity is reduced (Ramstad et al). Many studies have shown that the best way to administer baclofen in through a pump, so that there can be a continuous supply of the medication to the body, and Ramstad et al found that within six months of starting a baclofen pump, patients had better sleeping patterns, less pain and better social function. Cooley also concluded that a baclofen pump could increase daily function, and could also make the caregiver’s job a bit easier. Another medication that is often used is botulinum-toxin, better known as Botox. Botox works by blocking the release of acetylcholine, which is a neurotransmitter in muscle, so the muscle in temporarily paralyzed and will not contract (Nigam), and when muscles cannot contract, they cannot have spasms. Papavasiliou claims that Botox, along with other forms of treatment such as therapy, could greatly reduce the possible need for orthopedic surgery which could save CP patients a lot of pain and time. Cooley also notes that Botox could be used to treat excessive drooling, which affects about 10% of children with CP, by paralyzing the facial muscles around the mouth. While medications may seem like the best option, they can be costly over a long period of time and can have adverse side effects so it is usually best to try other forms of treatment first.

If these various treatments do not provide relief from the symptoms of CP, patients can also undergo several different surgeries to help repair their muscles. Many conditions can result from muscle spasticity including scoliosis, hip dislocation, and loss of joint function due to sustained tightness in muscles and tendons (Murphy et al), but most of these issues can be solved with orthopedic surgery. One type of surgery is single event multilevel surgery (SEMLS) which is a dual purpose operation that is used to correct muscle imbalance and bone deformities at the same time (Akerstedt et al). Akerstedt et al conducted a study where they observed children after they had various types of SEMLS, and they found that there were improvements in walking capability and maximum gait distance for almost all children. Another type of surgery is tendon lengthening or releasing which would help relax the muscles so less spasticity would occur (Murphy et al). Along with surgeries to fix muscle tone, Murphy et al found that one of the most common surgeries performed on CP patients in the insertion of a feeding tube since many patients can have trouble swallowing their food. Surgery is usually a last resort method because, as Murphy et al stated, CP patients “may be at higher risk for surgical complications and poorer outcomes” than patients who do not have the disorder.

Overall, living with CP can be difficult, but by working with a team of doctors and professionals, patients can make their day to day lives a little easier. Since there are so many different symptoms and each patient can have a variety of them, it is important to collaborate with the team to find out what is needed to improve functionality for each person. Occupational and physical therapy play a huge role in the improvement of mobility and other specialized doctors such as a dietician and ophthalmologist can help solve specific problems. If these non-invasive methods do not work effectively, patients can take medications to reduce muscle spasticity while some patients must resort to surgery to fix both bone and muscle deformations. The result is a lifelong care team that can greatly influence the quality of life for people with cerebral palsy.

Bibliography

Akerstedt, Anita, Olof Risto, Pia Odman and Birgitta Oberg. “Evaluation of Single Event Multilevel Surgery and Rehabilitation in Children and Youth with Cerebral Palsy – A 2-Year Follow-Up Study.” *Disability and Rehabilitation* 32.7 (2010): 530-539. *Academic Search Premier.* Web. 19 April 2013.

Bar-Haim, Simona, Netta Harries, Ibtisam Nammourah, Saleh Oraibi, Waddah Malhees, Jack Loeppky, Neil J Perkins, Mark Belokopytov, Jacob Kaplanski and Eli Lahat. “Effectiveness of Motor Learning Coaching in Children with Cerebral Palsy: A Randomized Controlled Trial.” *Clinical Rehabilitation* 24.11 (2010): 1009-1020. *Academic Search Premier.* Web. 3 April 2013.

Bryant, Elizabeth, Terry Pountney, Heather Williams and Natalie Edelman. “Can a Six-Week Exercise Intervention Improve Gross Motor Function for Non-Ambulant Children with Cerebral Palsy? A Pilot Randomized Controlled Trial.” *Clinical Rehabilitation* 27.2 (2012): 150-159. *Health and Medical Complete.* Web. 4 April 2013.

Chen, Chia-Ling, Lin-Ju Kang, Wei-Hsien Hong, Fei-Chuan Chen, Hseih-Ching Chen and Ching-Yi Wu. “Effect of Therapist-Based Constraint-Induced Therapy at Home on Motor Control, Motor Performance and Daily Function in Children with Cerebral Palsy: A Randomized Controlled Study.” *Clinical Rehabilitation* 27.3 (2013): 236-245. *Academic Search Premier.* Web. 3 April 2013.

Cooley, W Carl. “Providing a Primary Care Medical Home for Children and Youth with Cerebral Palsy.” *American Academy of Pediatrics* 114.4 (2004): 1106-1112. *Academic Search Premier.* Web. 19 April 2013.

“Data and Statistics for Cerebral Palsy.” *Centers for Disease Control and Prevention* (2012). Web. 19 April 2013.

Hoch, Daniel B, Neil K Kaneshiro and David Zieve. “Cerebral Palsy”. *A.D.A.M. Medical Encyclopedia* (2009). *PubMed Health*. Web. 9 April 2013.

Mayston, Margaret. “From ‘One Size Fits All’ to Tailor-Made Physical Intervention for Cerebral Palsy.” *Developmental Medicine and Child Neurology* 53.11 (2011): 969-970. *Health and Medical Complete.* Web. 4 April 2013.

Merriam-Webster’s Collegiate Dictionary. Eleventh Edition. 2003. Web.

Murphy, Nancy A, Charles Hoff, Trisha Jorgensen, Chuck Norlin, Sean Firth and Paul C Young. “A National Perspective of Surgery in Children with Cerebral Palsy.” *Pediatric Rehabilitation* 9.3 (2006): 293-300. *Academic Search Premier.* Web. 19 April 2013.

Nigam, PK and Anjana Nigam. “Botulinum Toxin.” *Indian Journal of Dermatology* 55.1 (2010): 8-14. *PubMed.* Web. 19 April 2013.

Papavasiliou, Antigone S. “Management of Motor Problems in Cerebral Palsy: A Critical Update For the Clinician.” *European Journal of Pediatric Neurology* 13.5 (2009): 387-396. *Neurosciences Abstracts.* Web. 9 April 2013.

Ramstad, K, R Jahnsen, B Lofterod and OH Skjedal. “Continuous Intrathecal Baclofen Therapy in Children with Cerebral Palsy – When Does Improvement Emerge?” *Acta Paediatrica* 99.11 (2010): 1661-1665. *Academic Search Premier.* Web. 3 April 2013.

Vargus-Adams, JN and LK Martin. “Domains of Importance for Parents, Medial Professionals and Youth With Cerebral Palsy Considering Treatment Outcomes.” *Child: Care, Health and Development* 37.2 (2011): 276-281. *Academic Search Premier.* Web. 3 April 2013.

Wu, Wen-Chi, Jen-Wen Hung, Chiung-Yi Tseng and Yi-Ching Huang. “Group Constraint-Induced Movement Therapy for Children with Hemiplegic Cerebral Palsy: A Pilot Study.” *American Journal of Occupational Therapy* 67.2 (2013): 201-208. *Health Reference Center Academic.* Web. 10 April 2013.