COGNITIVE REHABILITATION THERAPY: WHAT IS IT AND WHY ARE WE NOT UTILIZING IT?

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ABSTRACT

Rehabilitation is a medical process that one may go through after a traumatic event, like a stroke or a traumatic brain injury, to return to their baseline normal physical self. Medical providers like physical therapists or speech therapists often are involved in this therapy process through speech and physical therapy for a specified length of time or until the patient shows improvement and they no longer need therapy. However, the patient with a cognitive dysfunction after an injury cannot reach what was perhaps their normal mental self without cognitive rehabilitation therapy (CRT). For some, the normal they seek to return to is beyond the realm of traditional therapy and simply a physical deficit. That is where CRT can benefit patients in their rehabilitation process with disabilities in their cognitive function, which are not as obvious to others, like a limp or a slurred speech.

Keywords: *cognitive rehabilitation, stroke, traumatic brain injury, therapy*

Rehabilitation is usually an intensive process medical professionals provide to assist their patient in returning their normal, baseline way of life after a traumatic event. More specifically rehabilitation commonly seen for a patient with a deficit after a traumatic injury, is a series of intense physical and mental processes, procedures, and tasks that a patient and their family experience in the attempt to return to their normal baseline standard of life. These therapies typically involve physical therapy (PT) and occupational therapy (OT), and even at times speech therapy (ST). These therapies describe the physical process most patients go through to regain muscle tone and strength, learn to swallow and form words, or regain their ability to perform activities of daily living. What about the devastation of mental and cognitive deficits traumatic injuries may inflict on an individual? The patient with a cognitive dysfunction after an injury, like a cerebral vascular accident (CVA) or a traumatic brain injury (TBI), cannot reach what was perhaps their normal standard of living, without cognitive rehabilitation therapy (CRT). For some the normal they seek to return to is beyond the realm of traditional PT, OT, and ST and the typical physical deficits, but deeper into the realm of what we cannot see, and perhaps has a less measurable outcome. That is where CRT can benefit patients with a cognitive deficit in their rehabilitation process. Though this is not a new therapy to healthcare, it is not common place and finding a facility that provides this treatment may be a challenge, as well as

insurance coverage to assist patients and their families with the financial burdens of therapy.

CRT: Background

Healthcare and rehabilitation therapies can be often times preoccupied with disabilities that are obvious to others, like a limp or a slurred speech. An event that alters one's cognitive abilities can have lasting effects on their work, educational career, and their personal and family life. Individuals who have suffered some sort of brain injury may experience physical disabilities, mental disabilities, or they may experience both physical and cognitive deficits. The Institute of Medicine (IOM) writes the most common cause of a cognitive deficit or impairment in the population of the Americans' is the result of TBI or a CVA (2011). Cognitive deficits can impact a person's life in regards to social skills, memory, judgment, or insight. The Centers for Disease Control (CDC) (2003) states that cognition is a neurophysiological-based function that can be modified by medical and rehabilitative treatments. Many of these patients with such cognitive impairments are unable to return to work related to speech and behavior, and not necessarily their physical abilities. It can be said that these patients may lose meaningful relationships and lose interest in things they once enjoyed. Ultimately the impact of losing or the impairment of cognitive function can affect the patient even more, at a deeper level that may not be as obvious like a physical impairment. Struchen, et al. (2008) writes that deficits in social and interpersonal skills from a TBI cause an interference in living in a community successfully and being able to productively work. A decrease in one's cognitive abilities can be as devastating as a physical impairment, if not more so, this is evidenced by the impact for the individual to have the knowledge and relationships they had before their TBI.

This is where CRT comes into the picture of rehabilitating the patient with a cognitive disability and providing them an opportunity to return back to their baseline cognitive function. The importance of improving deficits that impact vocational outcomes and social integration, like marriage or support systems are discussed in recent studies concerning CRT. A successful outcome and major goal of rehabilitation efforts is for these patients to return to a productive baseline after a TBI (Struchen, Clark, Sander, Mills, Evans, & Kurtz, 2008). Brain injuries can range in severity and often it takes time for cognitive deficits to become apparent to the patient or to their loved ones as they begin the process of recovery. A cognitive deficit is described as an impairment in one's mental processes that leads to the acquisition of information and knowledge, it is the drive of individual understanding (Schofield, 2016). A majority of cognitive functions consist of one's ability to hold attention, decision making, transfer of skills and knowledge, judgment making, planning, perception, and so on. One's cognitive abilities and behaviors have a large impact in how people interact, work, and learn. A disruption in one or many cognitive abilities can have a huge impact in the daily lives of a person, thus also impacting their support systems and relationships. The importance to CRT in one's recovery should be of the utmost importance when rehabilitation efforts are being considered. Unfortunately, too often this therapy is not available or not even a realistic option for most.

According to Brown (2012), CRT is the various treatments that address cognitive deficits after a brain injury. The concept of CRT becomes holds a great deal of importance for people who live with cognitive deficits caused by a TBI. The concept of CRT in the process of rehabilitation, was started in the late 1970s as a treatment for patients with acquired brain injuries like stroke, infection, multiple sclerosis or traumatic injury (IOM, 2011). So one can see the same problems that were initially treated by CRT, remain primarily the same today. The IOM, (2011) describes CRT as an attempt to increase functioning and independence in the population impacted by cognitive impairments from brain damage or disease. CRT can be done as an inpatient or as an outpatient, and is led by a trained physical therapist, occupational therapist, speech therapist, nurse, or a psychologist. These healthcare providers should be trained in delivering high quality CRT and treatment plans should be formulated with respect to prognosis, natural history, targeting specific problems, and outcomes should be realistic and measureable (Katz, Ashley, O'Shanick, & Connors, 2006).

CRT is made up of two primary approaches in treatment by way of restorative treatment and compensatory treatment. Restorative treatment focuses on improving the overall function and abilities of one's cognitive system through a variety of activities. Compensatory treatment uses strategies like problem solving strategies and memory notebooks to help improve cognitive functioning (Brown, 2012, Institute of Medicine, 2011). CRT is usually tailored to meet specific cognitive needs of patients and the level of support one may have. A successful CRT can be described as a combination of other forms of therapy, like speech or physical therapy, and medications along with CRT treatment to enhance the overall outcome for the patient.

Research Supporting CRT

Recently, more research is evident by the increased number of people affected by a TBI, like military personnel, professional athletes, and school aged athletes. There has become an increased awareness to the cognitive deficits one may face after a TBI, and the goal to rehabilitate this population back to being a productive person puts emphasis on the discussion and research into CRT. Professional athletes as well as school aged athletes are being plagued with lingering cognitive deficits after suffering from a TBI, that are only recently coming to the surface. However, the research showing the effectiveness of CRT in patients with a cognitive deficit is limited. The nature of a cognitive deficit is not as tangible as a physical disability, and support for CRT is limited due to the lack of validity and reliability in many studies on the therpay. Studies done by the IOM have shown that there is yet to be sufficient data providing a definitive guideline for clinical practice (IOM, 2011). This is especially true in regards to determining the specific therapy indicated for patients. News from the National Academies (2011) supports this by writing that there is not enough data to produce guidelines on how to use CRT and determining specific therapies for patients. Studies done to show the effectiveness of CRT simply have too many variables in research designs and the cohesion of guidelines regarding CRT as whole. Determining the validity in cognitive function and the individual needs will be very hard to prove, because

one's cognitive needs cannot be predicted no more than the TBI they experienced could have been predicted. CRT contains many different components to treatment that singling out specific parts of therapies to show their effectiveness will be time consuming. The overall benefits to therapy and treatment and the lack of adverse outcomes associated with CRT, should be sufficient enough to provide justification for the service. Severity of brain injuries and sample sizes were also a factor that negatively impacts the validity of research.

The IOM recommends that research continue to strengthen the validity with larger sample sizes and more data to support the benefits of CRT in practice to improve outcomes for a person with a cognitive dysfunction (IOM, 2011). The IOM goes on to support the benefits of CRT in the patient with a TBI after the acute phase of recovery. Patients can continue to show improvements in cognitive function as long as the treatment continues towards functional goals of recovery (IOM, 2011). The benefit of CRT that has been seen and because there are little to no poor outcomes associated with CRT should be the beginnings of a strong foundation in rehabilitation. That being said, it can argued that the poor outcomes associated with medical treatments like pharmaceuticals and medical devices, which have the research to support their use in medicine and therapies, should be on a level playing field in the medical field. News from the National Academies (2011) writes that the research that has been done, shows positive results for patients involved in CRT, but research and methods of research need to be strengthened by improved data collection. This point should be taken into consideration when trying to develop a broad base of guidelines to follow, not whether or not to implement the use of CRT.

A study done by Struchen, et al. (2008) discusses that neuropsychologists should consider when choosing tests to administer, to recognize that making accurate conclusions and recommendations does not depend only on neuropsychological test performance, but also look at emotional functioning, environment, and pre-injury abilities. Struchen, et al. (2008) goes on to discuss their findings show that one's social communication abilities along with one's emotion perception skills, self-rating of communicative ability, and social problem-solving ability should also be included in a neuropsychological assessment. This study is just one example of the many parts of CRT that need more research and more definitive guidelines to lead the practice, but should not exclude the concept completely.

The research that is available does show that overall CRT is effective in the various forms available when it is carried out by trained medical professionals for a patient in the recovery phase of their TBI. Cicerone, et al. (2000) notes that overall research has shown the effectiveness of several forms of cognitive rehabilitation for those with stroke and TBI. This field now needs to continue to show the consistency of improved patient outocmes and specific guidelines to strengthen the validity of CRT.

Accessibility to CRT

As discussed, CRT needs more data to improve and initiate guidelines to standardize the therapy. Brown (2012) writes that private insurance companies

typically deny coverage for CRT because of the lack of valid research and findings. A patient that is fortunate enough to have access to a CRT program may ultimately have to pay out of pocket for treatment or simply just not go through CRT. Either way can be detrimental to the patient and their family. CRT is not a new concept, but the implementation by healthcare facilities and coverage by insurance is. Often many health care facilities do not even have a program in place to offer patients. The research that is available shows the benefits of CRT, and we can see that therapy can be done by employees who already in their roles as a speech therapist, physical therapist, occupational therapist, and even nurses. It may be a question of time and money needed to train those employees in CRT that is a barrier to facilities implementing this treatment.

There are now other opportunities available that may increase the utilization of CRT. Online programs of CRT are being developed so that the patient can access treatment, when they otherwise may not be able to do so. A study by Yoo, Yong, Chung, and Yang (2015) discusses the use of a computer based CRT program. The program they researched was made up of around twenty detailed training programs for effective rehabilitation of cognitive function impairment and host a variety of items that closely mimic reality for the patient (Yoo, Yong, Chung, & Yang, 2015). The Veterans Affairs (VA) has also utilized a computer based program that can even be used on a smart phone. However this program is very specific in regards to tasks according to Crawford and Mirkin (2014), which may not serve the population needing CRT after a TBI as a whole. Specific task oriented programs do not produce outcomes associated with improved function in daily living. A computer based program that is more diverse and can change the range of difficulty according other the patient are more in line with improved cognitive function while using a computer based program.

While access to CRT by using the computer or smartphone helps with accessibility to therapy, there is still an issue to payment. Online programs can still be expensive and must be overseen by a trained medical professional, and there is always the concern of insurance coverage. Online options are a step in the right direction towards treatment availability, but there continues to be barriers to therapy services. Katz, Ashley, O'Shanick, and Connors, (2006) argue that cognitive rehabilitation demonstrates effectiveness in reducing cognitive disability after a brain injury and should be covered by public and private medical insurance. Katz, Ashley, O'Shanick, and Connors (2006) also express the need for the Centers for Medicare and Medicaid Services (CMS) to take the lead in the provision of ongoing payment for medically necessary services for treatment of cognitive dysfunction. This act by CMS would influence coverage of services by private insurance companies and may provide more available services to the public.

Current Barriers to CRT

The evidence that is seen now shows the benefits to CRT, the problem is there needs to be more valid research with better defined guidelines. Like any medical treatment, the benefits must outweigh the risks. In the case of CRT there are little risks associated with participating in CRT, but it can be argued that not participating is detrimental to the patient and their family. According to the

Centers for Disease Control, long term complications from a CVA or TBI are related to thinking, sensation, language, and emotion. CVA and TBI are also linked to chronic health conditions like Alzheimer's disease, Parkinson's disease, seizure disorders, and other brain disorders (CDC, National Center for Injury Prevention and Control, 2003). These diagnoses have a lasting impact on patients when returning back to their previous standard of living as well as their families. The question is how insurance companies can justify not providing coverage for CRT, even with a lack of research, when the long term ramifications of untreated CVA and TBI deficits are significant.

The Brain Injury Association of America (BIAA) reports that the estimated costs associated with a person with a TBI over a lifetime costs are estimated at $600,000 to $1.8 million (Katz, Ashley, O'Shanick, & Connors, 2006). Policies that do not cover CRT leave the short term financial burdens on the patient and their families, causing a ripple effect of placing the financial burden of long term care on the family and patient as well. The benefit of covering CRT by an insurance company is to ultimately return the patient back to a productive individual with little long term complications to have the financial burden of in the long term. In other words, CRT should be seen as an investment if anything by their insurance provider.

Research being done only continues to strengthen the validity of CRT, with little adverse events associated with the treatment. The BIAA supports this rationale that care should be a provided treatment for those insured with public or private insurance and the research to develop guidelines to should continue. The BIAA goes on to discuss in the text, their recommendations to decrease barriers to CRT. Among these recommendations are that CRT should be a covered and supported benefit for persons suffering with a TBI and/or CVA by all public and private payers, CRT should be based on sound research and evidence for best practices with clearly stated, individualized goals and quantifiable outcomes, and CRT should be provided by trained staff and proper training of staff should also be available (Katz, Ashley, O'Shanick, & Connors, 2006).

As Katz, Ashley, O'Shanick, & Connors (2006) point out, the present health care system often only supports the early care of persons with brain injury, and often little support for the long term care needed. As with many other health problems like heart disease and diabetes and other chronic disease processes; maintenance and routine care are vital to health promotion and maintaining patients on the path to optimal health. Healthcare continues to improve and extend lives, coverage and therapies should expand past the acute phase and overlap into the chronic phase of health promotion.

CONCLUSION

There is much still unknown of how the brain works and how the brain recovers. The benefits of CRT on the recovery in a patient after a TBI suffering from cognitive impairments continue to be strengthened by ongoing research and the success stories often associated with CRT. Healthcare professionals should be made aware of this treatment option and should advocate for their patient in the

use of CRT in their patient's recovery. Patients and their support groups need to also know they have this option and there are benefits to long term outcomes. Availability, accessibility, and the process of rehabilitation therapies for those suffering from a TBI must be improved. Often when therapies or treatments are evaluated, the benefit must outweigh the risk. In the case of CRT and the impact this therapy can have on cognitive impairments show little risk, and much hope.

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