

Regaining Focus After a Brain Injury

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For most of us, juggling the daily demands of home and work is a challenge. For many people with traumatic brain injury (TBI), however, impaired attention makes these day-to-day chores an insurmountable struggle. The sound of a passing car or the sight of a passer-by creates disruptions that derail them from their goals.

“Attention impairments make it more difficult to pay attention to things that are important and to resist being distracted by things that are not,” says John Whyte, MD, PhD, Director, Moss Rehabilitation Research Institute. “People with attention problems may have difficulty completing a task, switching their focus between two tasks or paying attention to two different things at the same time.”

Impaired Attention: a Barrier to Recovery

Impaired attention is a common consequence of TBI. It often results from injury to the brain’s frontal lobes, which play a major role in controlling attention. TBI also tears at the small fibers that connect nerve cells. Loss of these nerve fibers slows down communication among cells and diminishes alertness throughout the entire brain.

As a result, impaired attention poses a major obstacle to a full recovery. It can hamper progress in a rehabilitation program and, ultimately, prevent the person from resuming their usual activities at work and at home. “As human beings, attention enables us to perform new tasks and concentrate on those that require time to complete,” says Dr. Whyte. “On the other hand, we can perform familiar tasks, such as driving, without much use of attention because we rely on habit. In these instances, attention is important to help us curb habitual behaviors. For example, driving to work every day tends to become a habit. But if we need to make a detour one morning to make a dental appointment, intact attention enables us to suppress the habit and avoid winding up at work.”



Testing Ritalin and Other Medications

Despite the severity and widespread nature of impaired attention after TBI, little is known about how to treat this problem. “That’s because attention is ‘invisible’ and as a result, difficult to measure,” says Dr. Whyte. “It can only be inferred by the quality of the person’s performance on tasks requiring attention.”

Most studies of attention have been small, focusing on the completion of one simple task. For example, a computer reaction test might measure distractibility by having participants press a key when the number three appears in the midst of many other irrelevant, flashing shapes. Another test might assess the ability to sustain attention by measuring the participant’s ability to complete a long, boring task. But according to Dr. Whyte, these small-scale studies don’t give researchers a clear picture of the problem or the best treatment measures. “No one computer test can measure all of the many facets that make up attention,” he says. “In real life, completing a task may require the ability to sustain attention during long, boring tasks while working in a distracting environment. To get a comprehensive picture of one’s abilities, you need to measure them in a number of different ways.”

A five-year, \$3 million grant awarded to Moss Rehabilitation Research Institute from the National Institutes of Health’s National Institute of Neurologic Disorders and stroke will help to provide researchers with more of the comprehensive information they need to treat impaired attention more effectively. “In contrast to previous studies, this research is quite comprehensive,”

says Dr. Whyte. “We will collect data in all areas of the participant’s life and examine many facets of attention.”

Traditionally, impaired attention has been treated with behavior therapy that requires the patient to complete a series of increasingly demanding tasks. Medications used to treat attention deficits in children have also been used. “However, these drugs have not been well studied and we had no substantial body of scientific evidence to support the use of these drugs in people with TBI,” says Dr. Whyte.

The grant will enable Dr. Whyte and his colleagues to study three drugs over the course of five years – methylphenidate (Ritalin), desipramine (both used to treat attention deficits in children) and bromocriptine. Ritalin is the first drug being studied.

Initial Results Hold Promise

Preliminary results indicate that Ritalin seems to benefit TBI patients by increasing their alertness and the speed with which they are able to perform tasks. In addition, people taking Ritalin are more likely to respond to people or computers who request information or an action.

Study participants come to Moss Rehabilitation Research Institute five full days a week for six weeks. Testing is conducted in the laboratory using computerized and paper and pencil tests, videotaping and scoring of behaviors, self and family assessments, and coding of behaviors.

“Ritalin has gotten some ‘bad press’ over years for being over-prescribed in children,” says Dr. Whyte. “Despite this controversy, Ritalin appears to be a very safe drug with few side effects. Some physicians have been prescribing it for TBI without research to support its use. We believe that it’s important to amass scientific evidence about the drug’s effectiveness in treating TBI and will base our recommendations on the results of this study.”

The grant will enable the study of three drugs – methylphenidate (Ritalin), bromocriptine and desipramine – all used to treat attention deficits in children.