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Editorial

Optometrists: Advocates for Children with Traumatic Brain Injury

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Abstract

As more and more children are diagnosed with vision symptoms resulting from Traumatic Brain Injury (TBI), there is an increased demand for optometrists to relay and translate the visual signs and symptoms of TBI to families, teachers and school administration. Without assessment and vision rehabilitation recommendations, children may not be able to fully participate and succeed in their academic endeavors.

Since, the beginning of time, people have fallen. Athletes have suffered concussions. Soldiers have endured war-related injuries. And optometrists have refracted.

Times have changed and while all the preceding is still true, the scope of optometric care has expanded dramatically beyond refraction to include medical and rehabilitative care to those athletes, veterans and people of all ages who have suffered an acquired brain injury.

Acquired Brain Injury (ABI) is any injury that occurs to the brain after birth and causes some level of neurological dysfunction, not caused by perinatal trauma, neurodegenerative disease or hereditary disease [1]. The causes of ABI can include cerebral vascular accident, anoxia, traumatic brain injury, or surgical or toxic insult to the brain [1].

The incidence of reported Acquired Brain Injury (ABI) has increased due to improved detection of injury, increased awareness of signs and symptoms and improved survival rates [2]. As medical professionals, coaches, and the general public are becoming more sensitive to the signs and symptoms of ABI, athletes, military personnel and family members are more likely to be referred for medical evaluation following the onset of an ABI.

Significant visual abnormalities can plague people who suffer an ABI, and optometrists are on the forefront of assessing patients for those issues. An ABI patient presents with a unique set of visual signs and symptoms that do not fall completely under the scope of traditional binocular vision or vision rehabilitation clinics. Convergence insufficiency, saccadic dysfunction and accommodative in facility are binocular vision findings that are not uncommon in this population [3]. Functional vision signs such as photoaversion and glare as well as visual field and contrast sensitivity loss may also present in these patients; this benefiting from a vision rehabilitation evaluation. As these patients present with a constellation of visual-cognitive, functional vision issues as well as deficiency in eye teaming skills, they require a harvest of a wide range of optometric testing to uncover the full picture of a patient's visual deficiencies.

Children also suffer ABI, and traumatic causes such as falls, sports related injuries and child abuse are the most common [2,4]. The overall incidence is not as common in children as adults, however the results of suffering an ABI is just as grave. TBI results in significant behavioral and visual complications that impact scholastic progress, social interactions and normal development. Additionally, epilepsy, sleep disturbances and depression may result. Children who suffer concussions must also be monitored; the effects of repeated concussions without residual neurologic damage in children are cumulative. That is, children who have one concussion are more likely to suffer a second one and as a child suffers multiple concussions, the symptoms may become more pronounced and are more likely to remain [4].

While the reported incidence of childhood traumatic brain injury as also increased due to awareness of TBI, there are likely multiple cases that are not reported due to lack of initial clinical or behavioral signs of TBI [5]. For example, a child playing junior league hockey may not be pulled from a game or evaluated by a medicalprofessional after an injury because there is no outward appearance of any neurological distress [5]. Children typically will heal faster than adults, and return to school and daily activities sooner as they may pass a neurologic screening [5].

Children who suffer any type of brain injury are susceptible to developing significant cognitive and behavioral problems and require careful attention to ensuring an effective delivery of classroom materials and coursework. In order to ensure each child has the assistance he needs, the development of an itinerant education plan requires a multidisciplinary assessment including a functional vision exam.

An evaluation with an optometrist to examine a child's ocular health and functional vision is a crucial first step to determine if visual deficits exist. The results of a routing exam will uncover deficiencies in eye teaming skills, refractive error and ocular health status, those skills that are to obtaining basic visual information and scene scanning. Further testing can be performed related to visual processing and visual cognition to assess the higher order visual processing.

Communication with parents as well as teachers and school psychologists is of paramount importance to determine the best educational approach when working with children who have suffered a brain injury. While most people have heard of "brain injury" the

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range of experience and knowledge of the resultant functional effects of brain injury each person involved in a child's education plan has may vary [2,4]. In a study by DeLuca, school psychologists who reported feeling confident in their knowledge base of what scholastic strategies would benefit children with a history of brain injury, it was found that several harvested several incorrect and potentially detrimental ideas regarding brain injuryandpotential educational delays [2]. Several questions regarding aspects of recovery and need for educational prognosis demonstrated those involved in developing an appropriate education plan for students with a history of brain injury had misconceptions that could hinder the potential for educational progress [2]. To assist in improving the delivery of care and education, additional reports and strategies from other medical and rehabilitative professionals is essential in filling in any gaps of missing information to ensure each child receives appropriate assistance [2,4].

In some educational settings, vision-related services and ongoing access to working with a vision teacher are reserved for children that present with a reduced visual acuity or visual field loss. In a study by Sabates, 88% of people who suffer a TBI refract to 20/20 and only 35% presented with visual field loss [6]. Therefore, most children will not qualify for vision teaching services and they are not afforded the necessary additional assistance and vision resources needed in the class room to keep up with their coursework, such as large print or auditory books or computer modifications. Therefore, it is in some cases the optometrists report and description of visual processing and eye testing deficits that may support a child getting access to additional resources he needs for school work.

Difficulties with cognition and sustained attention may make formal vision therapy difficult however attempts to restore visual function should be attempted. Should participation in vision therapy not prove fruitful or access to those services due to transportation or schedules, compensation of visual dysfunction should be considered in the interim [7]. Patient centered modifications such as occlusion or environmental modifications to reduce visual strain and stress. Additionally difficulty with sustained reading and saccadic dysfunction may prohibit a child from completing reading assignments, even with successful participation in a vision therapy program; a suggestion to use an auditory format may reduce visual stress and allow the child to finish assignments on time.

In conclusion, children with visual dysfunction from brain injury require an assessment of visual and visual cognitive abilities. While these children may not present with poor vision or field loss, they may exhibit those visual deficits that inhibit learning and require additional attention and access to resources in the class room settings. With proper communication and support of visual deficiencies, optometrists can translate and advocate for vision services for children with brain injury.

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