Living a Life of Double Vision

Amber Cumings

Senior Honors Student: Michigan College of Optometry

Introduction

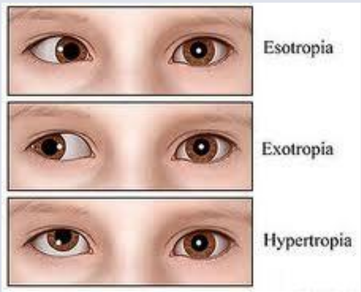
Many children in the world suffer from an eye condition called Amblyopia, or better known as "lazy eye." Amblyopia is "the loss of one eye's ability to see details." This condition arises when the nerve pathway from one of the eyes to the brain does not develop properly, which in consequence causes vision problems such as double vision.

There are a variety of types of amblyopia depending on how the condition arose.

- Strabismic amblyopia: The most common form of amblyopia; when the misaligned eye causes double vision and the brain ignores visual input from that eye.
- Refractive Amblyopia: This form does not involve a misaligned eye but instead deals with unequal refractive error between the two eyes. The brain ignores visual input from the uncorrected, blurry eye, causing amblyopia.
- Deprivation Amblyopia: Congenital cataracts are the most common cause of deprivation amblyopia because light is being obstructed from the visual pathway in one of the eyes. This in turn causes amblyopia because the brain is ignoring the input.

Along with types of amblyopia, there are a variety of different classifications on how the eye is turned, especially for strabismus.

- Tropia: a manifest deviation, detectable with both eyes open or with a cover test. A tropia can be constant or intermittent and may involve one eye or both eyes.
- Phoria: a latent deviation, detectable only when one eye is covered so that vision is monocular. The deviation in a phoria is latent because the brain, using the extraocular muscles, corrects the minor misalignment.



Treatment Methods

With amblyopia, there are many treatments available such as patching, spectacles, atropine drops, and vision therapy.

- Patching: Patients wear a patch over the dominant eye for several hours a day over the course of a few months.
- Spectacles: Patients are often prescribed with spectacles that include a prism to allow the eyes to view an image without strain.
- Atropine drops: Patients administer atropine eye drops into the dominant eye to create occlusion much like with patching.
- Vision Therapy: Passive vision therapy includes the above options supplemented with active vision therapy that is designed to improve the patients conscious involvement in the visual processing mechanism. There are a variety of different exercises that can be implemented when treating amblyopia.

Research and Results

Patching

A study was conducted by the Pediatric Eye Disease Investigator Group to determine the results of patching from 6 hours a day up to the all waking hours. The study group had follow-up examinations at 5 weeks, 16 weeks, and 6 months. It was determined that if the amblyopia was quite severe, a longer amount of time using the patch yielded greater results in visual acuity. For patients with mild amblyopia, the amount of time wearing a patch was not significant ("The course of moderate amblyopia treated with patching in children," 2003).

Atropine Drops

The use of atropine has been tested in randomized trials as a comparison to the use of patching. One study was done by the Eye Research Center of Guilan University of Medical Sciences to determine the effectiveness of atropine vs. patching. It was concluded that both methods of treatment yielded approximately 3.7 lines of visual acuity from the base line (Medghalchi & Dalili, 2011). To extrapolate from this study, another group did a survey of families who were affected by either atropine or patching treatment. The purpose of this survey was to determine the psychosocial impact of patching and atropine treatments on both the child and their family. It was concluded that most families preferred the use of atropine as a form of treatment for Amblyopia (Pediatric Eye Disease Investigator Group, 2003).

Spectacle Correction

A study was done by the Pediatric Eye Disease Investigator Group to determine the effect of using glasses as the base form of treatment for amblyopia in children from ages three to ten years old. The mean improvement of visual acuity, from a baseline of 20/40 to 20/80, was approximately 3.4 lines after one year and the improvement, from a baseline of 20/100 to 20/320, was 6.3 lines (Wallace et al., 2007).

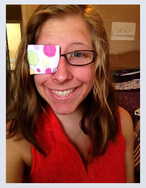
Age as a Factor

A study was done to examine the effect of age on response to treatment of amblyopia in children from ages three to less than thirteen years. Each child was placed in a group according to their age: 3 to less than 5 years, 5 to less than 7 years, and 7 to less than 13 years. It was concluded that the older age group, 7 to less than 13 years, was significantly less responsive to treatment than the two younger groups (Holmes et al., 2011).

Personal Experience

I have lived with double vision my entire life and have dedicated years of research to amblyopia and other similar disorders. My left eye is "lazy" due to a trochlear nerve palsy to my superior oblique muscle. The muscle has difficulties holding my eye in a primary gaze without the aid of spectacles. My condition is classified as a left hypertropia combined with an esotropia.

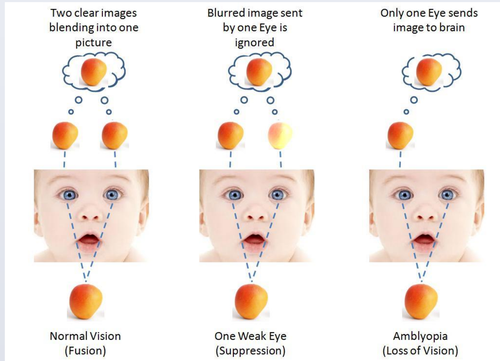
As of December 2014, I have been actively involved in vision therapy at the Michigan College of Optometry with one of the residents and the dean of the college. I began working with a patch viewing letters up close and far away. Over the next few months I started working with a Brock String to facilitate my near and far convergence. These techniques are designed to help develop new neural pathways for my visual system. Recently I was prescribed new glasses that have 4 less diopters of prism. This alteration demonstrates the progress that I have achieved in just a few months.



During my active vision therapy sessions, I work on strengthening my ability to fuse separate images. There are several methods that I have used over the last few months ranging from pulling pegs out of a moving board to finding letters while wearing stereo glasses. These are essential for trying to get rid of the double vision that accompanies amblyopia and I have noticed a significant difference since the beginning of treatment.

Conclusions

- It has been determined that patching regimens are quite effective in treating amblyopia. This technique has been used for decades because it yields such positive and reliable results.
- The use of atropine has also been found to help treat the condition with good psychosocial results from the subjects and their families. In other words, families find it more socially acceptable to use atropine drops rather than wearing a patch for extended periods of time.
- Each of these treatments can be coupled with the prescribing of glasses to the patient or with vision therapy. A fully combined treatment plan can yield maximized results for increased visual acuity especially if done during the early stages of childhood.



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