Updates in uses of amniotic membrane in Ophthalmic practice

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ABSTRACT

Amniotic membrane is the innermost layer of (be fetal membranes. It has special histological features that provides it with unique properties including anti-inflammatory, anti-microbial and anti-scarring cO'ecls. It promotes epthelialization and pain reduction, Another characteristic feature of amniotic membrane is the lack of imunogenicity.

The use of amniotic membrane transplantation (AMI) to treat ocular surface abnormalities was first reported five decades ago.

Amniotic membrane lias been successfully used **in** patients with persistent epithelial defects, chemical burn, pterygium, **symblepharon,** and for ocular surface reconstruction. **AMT** is a safe and useful **conjunctiva)** substitute to cover donor sclcra **in** situations where **conjunctival** scarring might **otherwise** preclude successful repair.

Amniotic membrane graft may be used for treating late-onset **filtering** bleb leakage in glaucoma patients.

Key Words:

Introduction, Uses of Amniotic Membrane, Surgical Technique.

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Hoping that this work would continue in order to provide such children with the quality of eye care they deserve.

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LIST OF ABBREVIATIONS

ASD	: Autism Spectrum disorder
ATNR	: Asymmetrical Tonic Neck Reflex
DCD	: Developmental coordination disorder
DEM	: Developmental eye movement
EPF	: Enhanced Perceptual Function
fMRI	: Functional Magnetic Resonance Imaging
HFA	: High Functioning Autism
LFA	: Low Functioning Autism
M-CHAT	: Modified Check list for Autism in Toddler
MFA	: Medium Functioning Autism
PDD	: Pervasive developmental disorder
SDD	: Specific Developmental Disorder
STNR	: Symmetrical Tonic Neck Reflex
TD	: Typically Developing
TLR	: Tonic Labyrinthine Reflex
TOVA	: Test Of Variables of Attention
WCC	: Weak Central Coherence

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INTRODUCTION

Autism Spectrum Disorder ASD is a complex developmental disorder that affects the brain's normal development of social and communication skills. Autism is the commonest of all autism spectrum disorder, characterized by impaired social interactions, impaired verbal and nonverbal communication, problems processing information from senses, and restricted and repetitive patterns of behavior **(Filipek et al., 1999)**.

Autism is a physical condition linked to abnormal biology and chemistry in the brain affecting the child before three years of age. The exact causes of these abnormalities remain unknown, and are a very active area of research. Genetic factors seem to be important. A number of other possible causes have been suspected, but not proven. They involve digestive tract changes, diet, mercury poisoning, vaccine sensitivity, and the body's inefficient use of vitamins and minerals **(Arndt et al., 2005)**.

Autism affects boys 3 to 4 times more often than girls. There is increased incidence of autism, partly due to newer definitions of autism. The term "autism" now includes a wide spectrum of symptoms, for example, a child who is diagnosed with high-functioning autism today may have been thought to simply be odd or strange 30 years ago **(Newschaffer et al., 2007)**.

At birth, the structure, size and growth of our eyes are almost complete. Once a baby is born, the eyes begin to learn how to function effectively with his body and brain. In order to function effectively, vision skills must automatically develop along with the baby’s motor and cognitive development. Up to 90% of individuals with ASD lack the vision

skills which determine how our eyes function. These skills do not seem to develop automatically **(Charles Hendrix, 1996)**.

Most autistic children seem to see perfectly well. However, we see not just with our eyes, but with our brains, and children with autism spectrum disorders frequently have neurological problems that prevent them from correctly interpreting what their eyes are seeing. As a result, even children with 20/20 eyesight may view the world in a distorted and confusing way. Because 80 percent of the information we receive from our environment is visual, this can result in severe disability. Their lack of attention to ambient vision, which has neural feedback loops to other sensory modalities, limits their ability to process information in areas involving posture, movement and speech. The effect of ambient visual problems, not surprisingly, can be catastrophic, disrupting the child's vision, and the world becomes a bizarre and frightening place **(Kaplan, 2006)**.

Seventy percent or more of children with ASD have problems with binocularity; they do not automatically develop an efficient binocular vision. Ophthalmologic findings in autistic children appear to be mainly unilateral or bilateral astigmatism and binocular vision troubles. Early diagnosis of visual problems in autistic children is essential in order to be able to propose adequate care **(Denis et al., 1997)**.

The visual patterns in ASD results in deficient eye-hand coordination, eye-foot coordination, eye movement control, convergence, difficulty with eye contact and eye-hand-foot-brain coordination. Vision skills impact the orientation to surroundings, resulting in abnormal body postures in ASD children **(Kaplan, 2006)**.

Positive changes in spatial orientation were evident when the children with ASD wore ambient prism lenses and included changes in posture from slanted to erect. Adjustments in spatial management were evident in improved ball catching ability, a task requiring visual tracking and eye-hand coordination. The findings suggest that alterations to the sensory systems may lead to behavioral change in some children **(Carmody et al., 2001)**.

Children with ASD can have a number of signs and symptoms that may bring them to the ophthalmologist office. It is important to thoroughly test their visual, perceptual, and oculomotor systems to determine the best way to help these patients. The use of vision therapy; a type of physical therapy for the eyes and brain, is a highly effective non-surgical treatment for many common visual problems present in autism spectrum disorder **(Allison et al., 2007)**.

Vision therapy, a type of physical therapy for the eyes and brain, is a highly effective non-surgical treatment for many common visual problems present in ASD such as amblyopia, heterophorias, diplopia, convergence insufficiency, dyslexia and learning disabilities **(Cohen et al., 1984)**.

Significant improvements in fusional reserves, accommodative facility have been noted in children with ASD after vision therapy. The results showed improvements in the visual and motor/visual perception subtests, confirming the significant changes in visual perceptual performance. This provides evidence supporting the use of vision therapy in ASD **(Hurst et al., 2006)**.

AIM OF REVIEW

The **aim** of this essay is to introduce the world of autism with its whole spectrum of disorders with which some ophthalmologists are not acquainted and to see through the eye of children with ASD to highlight its dysfunctions and its abnormal visual perception.

We also aim at providing knowledge of the increasingly prevalent autistic disorders, revealing the inside out of ASD with concentration on the eye of the autistic child, so that general ophthalmologists can become more aware and thus more capable of diagnosing and providing help to improve the vision and hence, the quality of life of those tiny children, in a world with increasing interest and demand for support to children with special needs.

AUTISM SPECTRUM DISORDER (ASD)

History:

The Latin word autismus was coined by the Swiss psychiatrist Eugen Bleuler in 1910 as he was defining symptoms of schizophrenia. He derived it from the Greek word autos, meaning self, and used it to mean morbid self-admiration, referring to "autistic withdrawal of the patient to his fantasies, against which any influence from outside becomes an intolerable disturbance. The word autism first took its modern sense in 1938 when Hans Asperger adopted Bleuler's terminology "autistic psychopaths" and was investigating a form of ASD now known as Asperger syndrome. Leo Kanner introduced the label early infantile autism in a 1943 reporting 11 children with striking behavioral similarities. Almost all the characteristics described in Kanner's first paper on the subject, notably "autistic aloneness" and "insistence on sameness", are still regarded as typical of the autistic spectrum of disorders **(Kanner, 1943; Kuhn and Cahn, 2004; Wolff, 2004; Happe et al., 2006)**.

Definition:

The WHO defines "Pervasive developmental disorders" (PDD) as a group of disorders characterized by qualitative abnormalities in reciprocal social interactions and in patterns of communication, and by a restricted, stereotyped, repetitive repertoire of interests and activities. These qualitative abnormalities are a pervasive feature of the individual's functioning in all situations.

While "Childhood Autism" is a type of pervasive developmental disorder that is defined by: (a) the presence of abnormal or impaired development that is manifest before the age of three years, and (b) the characteristic type of abnormal functioning in all the three areas of psychopathology: reciprocal social interaction, communication, and restricted, stereotyped, repetitive behaviour. In addition to these specific diagnostic features, a range of other nonspecific problems are common, such as phobias, sleeping and eating disturbances, temper tantrums[1], and (self-directed) aggression **(World Health Organization, 2006)**.

Autism spectrum disorder (ASD) refers to the pervasive developmental disorders which represent a variable group of conditions (the commonest of which is autism) that have similar characteristics, and a wide variability of impact on everyday functioning. The scope, variety, and severity of symptoms differ in each individual **(Lord et al., 2000; Myers and Johnson, 2007)**.

Autism is a brain development disorder that first gives signs during infancy or childhood and follows a steady course without remission or relapse. Impairments result from maturation-related changes in various systems of the brain **(Penn, 2006)**.

Classification:

The manifestations of ASD cover a wide spectrum, ranging from individuals with severe impairments-who may be silent, mentally disabled, and locked into hand flapping and rocking-to less impaired individuals who

[1] Tantrum: sudden uncontrolled attack of anger.

may have active but distinctly odd social approaches, narrowly focused interests, and verbose[2], pedantic[3] communication. Sometimes the syndrome is divided into low-, medium- and high-functioning ASD (LFA, MFA ,and HFA), based on IQ thresholds, or on how much support the individual requires in daily life **(Happe, 1999; Cohen et al., 2005; Baron-Cohen, 2006)**.

Causes:

The underlying pathophysiology of PDD is still under investigation. Current research implicates several CNS systems at different levels. For example, at the molecular level, the type of serotonin-transporter gene promoter may modulate the severity of PDD. Recent data suggest a role for immune system. Autism has a strong genetic basis, although its genetics are complex and it is unclear whether autism is explained more by multigene interactions or by rare mutations. In rare cases, autism is strongly associated with agents that cause birth defects. Other proposed causes, such as childhood vaccines, are controversial and the vaccine hypotheses lack convincing scientific evidence. The risk of autism is associated with several prenatal and perinatal risk factors. A 2007 review of risk factors found associated parental characteristics that included advanced maternal age, advanced paternal age, and maternal place of birth, and also found associated obstetric conditions that included low birth weight, short gestation duration, and hypoxia during childbirth. Environmental factors that have been claimed to contribute to or exacerbate autism include certain foods, infectious disease, heavy metals, solvents, diesel exhaust, phenols

[2] Verbose: using too many words.
[3] Pedantic: too much attention to details.

used in plastic products, pesticides, alcohol, smoking, illicit drugs, and vaccines **(Arndt et al., 2005; Redcay and Courchesne, 2005; Kolevzon et al., 2007; Newschaffer et al., 2007)**.

Prevalence:

Most recent reviews estimate a prevalence of one to two cases per 1,000 people for autism, and about six per 1,000 for ASD, The number of people known to have autism has increased dramatically since the 1980s, at least partly due to changes in diagnostic practice; the question of whether actual prevalence has increased is unresolved. The male-to-female ratio is 3-4:1. Autistic disorder is most common in boys who have the 46, XY karyotype. In some studies, fragile X is reported in approximately one tenth of males with autistic disorder **(Bailey et al., 1993; Newschaffer et al., 2007)**.

Characteristics:

Social development:

People with autism have social impairments and often lack the intuition[4] about others that many people take for granted. These impairments become apparent early in childhood and continue through adulthood. Autistic infants show less attention to social stimuli, smile and look at others less often, and respond less to their own name. Autistic toddlers have more striking social deviance; for example, they have less eye contact and anticipatory postures **(Volkmar et al., 2005)**.

[4] Intuition: the power of understanding something without reasoning.