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The presence of Streff syndrome in emotionally disturbed children

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Streff syndrome consists of a bilateral decrease in visual acuity in young people, ages 8 to 18, that is not explained by pathological disorders or refractive error. The decrease in acuity is generally worse at near than at distance and is not immediately correctable with corrective lenses. Other aspects of the syndrome include poor ocular pursuits, poor fixations and saccades. Color vision anomalies and constricted visual fields are common. Subjective complaints include headaches, words running together, diplopia and dizziness. Academic problems are also commonly reported. A strong association between emotional stresses in a young person's life and Streff syndrome has been suspected as an etiology. The Christie School is a residential facility for physically, emotionally and sexually abused children in Marylhurst, Oregon. The children obtain their primary vision care from Bruce Wojciechowski, OD. A review of the 71 records of the children who are residents of the Christie School who were patients at his office in the last three years was made. It was determined that a prevalence of 16.90% of the patients were diagnosed with Streff syndrome. This is 2.73 to 12 times the previously published prevalence of Streff syndrome in non-emotionally disturbed children. The ratio of boys to girls with Streff syndrome was 66% girls to 33% boys, which matches well with previous studies. Four cases studies of children diagnosed with Streff syndrome from the Christie School are presented. Treatment has been shown to be effective with low plus lenses and vision therapy.

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THE PRESENCE OF
STREFF SYNDROME
IN
EMOTIONALLY DISTURBED CHILDREN

by

STACY L. METZGER

A thesis submitted to the faculty of the
College of Optometry
Pacific University
Forest Grove, Oregon
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Doctor of Optometry
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Stacy L. Metzger will graduate from the College of Optometry at Pacific University in May, 1998. She has a BS and MS in Geology, and is certified to teach secondary science. She recently completed her preceptorship with Bruce Wojciechowski, OD, where she became interested in Streff syndrome and the children of the Christie School. Her previous preceptorship was at the VA Hospital in Portland. She lives in Forest Grove with her wonderful family, Bill, her husband, and their two children, David and Megan.
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Streff syndrome consists of a bilateral decrease in visual acuity in young people, ages 8 to 18, that is not explained by pathological disorders or refractive error. The decrease in acuity is generally worse at near than at distance and is not immediately correctable with corrective lenses. Other aspects of the syndrome include poor ocular pursuits, poor fixations and saccades. Color vision anomalies and constricted visual fields are common. Subjective complaints include headaches, words running together, diplopia and dizziness. Academic problems are also commonly reported. A strong association between emotional stresses in a young person's life and Streff syndrome has been suspected as an etiology. The Christie School is a residential facility for physically, emotionally and sexually abused children in Marylhurst, Oregon. The children obtain their primary vision care from Bruce Wojciechowski, OD. A review of the 71 records of the children who are residents of the Christie School who were patients at his office in the last three years was made. It was determined that a prevalence of 16.90% of the patients were diagnosed with Streff syndrome. This is 2.73 to 12 times the previously published prevalence of Streff syndrome in non-emotionally disturbed children. The ratio of boys to girls with Streff syndrome was 66% girls to 33% boys, which matches well with previous studies. Four cases studies of children diagnosed with Streff syndrome from the Christie School are presented. Treatment has been shown to be effective with low plus lenses and vision therapy.
Introduction

Children and adolescents who have been diagnosed with severe emotional disturbances commonly present with a visual disorder known as Streff syndrome. The Christie School is a residential facility for physically, emotionally and sexually abused children located in Marylhurst, Oregon. The ages of the children are from eight to eighteen. During the years 1984 to 1997 Bruce Wojciechowski, OD, and his associates have seen approximately 193 patients from the Christie School. A review of the available records of the 71 patients seen in his office from the Christie School from the last 3 years was made to determine the incidence of Streff syndrome in emotionally disturbed children. Four case histories of children diagnosed with Streff syndrome are presented to illustrate the similarities and differences of the signs and symptoms found in these children, the challenges faced when testing these children and some of the treatment options.

Streff syndrome consists of bilateral decrease in acuity that is not explained by organic, systemic processes or refractive errors. The decrease in acuity is generally worse at near than at distance. The poor acuities are not correctable with lenses. The refractive error is generally low and ranges from -0.50 to +1.00 Diopters (D). Other aspects of the syndrome include an extremely close working distance, as well as poor pursuits, fixations and saccades. Subjective complaints by the patients may include headaches, words
run together, eyes hurt and dizziness.\textsuperscript{1,2,3} Academic problems are commonly reported\textsuperscript{3-4} as well as color vision anomalies and restricted fields.\textsuperscript{4-7} Acuities are variable and may be improved by pointing or by using single letters.\textsuperscript{6} Although these signs and symptoms are the most common to Streff syndrome, they may not be found in all cases of the syndrome.

Erickson, et.al.\textsuperscript{2}, attempted to differentially diagnose malingering, hysterical amblyopia and Streff syndrome. Theoretically, the difference lies in the etiology; hysterical amblyopia is an unexplained reduced acuity that has an emotional or psychological etiology, malingering often has an etiology of need for attention or an attempt to get out of work or a military assignment\textsuperscript{2-3,8}. Erickson, et.al.\textsuperscript{2}, determined that from a ‘clinical practical view the differential diagnosis was very difficult’ and that many patients have symptoms that were similar to all three diagnoses.

It has become evident that emotional or psychological stresses in a young person’s life can be the etiology of Streff syndrome. Streff originally stated in his 1966\textsuperscript{3} paper that the syndrome did not have an emotional basis. In his 1994 paper, Streff\textsuperscript{7} changed his stance and pointed out that there was “the ability of the syndrome to be “triggered” either by physical or emotional trauma.” He further stated that, “Although the normal response should be to recover when immediate trauma is reduced, some children do not make the expected transition after the overload and adapt to the pattern itself” of Streff syndrome.\textsuperscript{7} Barnard\textsuperscript{9} also reported that ‘visual conversion reaction’ (the Freudian
psychiatric/medical diagnosis that resembles Streff syndrome and hysterical amblyopia) often manifests after an accident or trauma.

In a previous study of fifty-five students in a school for emotionally disturbed children, Lieberman\textsuperscript{10} found a high prevalence of visual disorders, especially perceptual motor, oculomotor and fusion disorders. Gilman\textsuperscript{11} reported that several children in his practice with known sexual and physical abuse presented with clinical findings that matched Streff syndrome. Van Balen and Slijper\textsuperscript{12} found a decrease in visual acuities in a group of children that they believed was “an expression of emotional conflict between the wish to express feelings of hostility, and the wish not to lose the love of the parents”\textsuperscript{12}. The children in their study also presented with other physical complaints, such as headaches, abdominal pain and fatigue, that were related to psychological stresses.

In her retrospective study to determine the prevalence of Streff syndrome in the patients of the pediatric clinic at the Southern College of Optometry, Kowalski\textsuperscript{4} found 25 (6.2\%) out of 402 patients were diagnosed with Streff syndrome. Of these, there were 15 girls and 10 boys. She also found a higher frequency of visual field abnormalities, (based on confrontational fields testing), and color vision disturbances (using the Keystone Skills Color perception Test) compared with children who did not have Streff syndrome\textsuperscript{4}. The color vision disturbances appeared with greater frequency than constricted visual fields, although constricted visual fields (tubular or spiraling) are often cited in the literature as pathognomonic for
hysterical amblyopia. Although her study attempted to determine the most common visual parameters of Streff syndrome, no mention was made of emotional or psychological disturbances in the children in her study.

Children and adolescents who have emotional stress in their lives, but have not been diagnosed as having severe emotional problems have been shown to exhibit visual disturbances that are similar to the Streff syndrome. In her study of children, Mantyjarvi found 1.75% (with an incidence of 1.4/1000/yr.) had bilateral amblyopia both at distance and near that was not correctable with prescription glasses. She believed the etiology of the functional amblyopia was the stress of puberty and pre-puberty. Hirsch found an incidence of functional amblyopia with a hysterical basis secondary to “social deprivation” to be one percent of the children he examined. Other researchers found similar epidemiology. Mantyjarvi concluded that the children had “psychogenic amblyopia” secondary to the stresses of pre-puberty and puberty. The age range in her study was from 7 to 18 years with a mean of 10.2 years. Based on an analysis of several studies, Barnard found 80% of the cases of “visual conversion reaction” were girls. Other researchers have found the ratio of girls to boys with Streff syndrome to be three to one.

Methods

During the last three years seventy-one patients from the Christie School had vision exams in the office of Bruce
Wojciechowski, OD. The patients are referred to his office by the resident staff nurse or by one of the Christie School teachers. At the Christie School the children and adolescents receive psychological treatment and attend classes with educators who are specially trained to work with emotionally disturbed children and adolescents. A retrospective review was made of the seventy-one records of the vision exams and vision therapy treatments of the Christie School patients.

The visual testing found in the records varied depending from patient to patient. With this population of patients with severe emotional or psychological problems there are many variables that commonly interfere with obtaining a complete vision exam, such as vague or inconsistent histories of treatment and poor medical history information. Another problem that interferes with a complete examination is that many times the patients act indifferent to the examination, or act as if they are unconcerned about their visual condition. This response was also noted by van Balen and Slijper, and referred to as “la belle indifference” by Barnard. Many of the emotionally disturbed children do not like things near their face, whether it is as small as fixation bead or large as a phoropter or slit lamp. This also effects the testing procedures that can be performed.

The patients from the Christie School are always accompanied by an attendant to the office. The patients also bring critical medical information with them provided by the Christie School medical staff that lists medications taken by the patient and their
known allergies. No information is given regarding their psychological condition, past history (medical, visual or otherwise) or psychological diagnoses. Each patient is generally asked to fill out a patient questionnaire that listed various complaints, i.e. do you frequently experience headaches, eye strain, etc. (although this is not always completed). A section was also filled out on personal health history, family health history, sports, hobbies and interests, etc.

In general, the following testing procedures were performed: near and distance acuities, non-contact tonometry, confrontational fields, pursuits, saccades, near point of convergence, cover test at near and distance and color testing. Distance retinoscopy, subjective refraction, horizontal and vertical phorias at distance and near, convergence and divergence at distance and near, positive and negative accommodation and cross cylinder testing at near. General anterior and posterior eye health testing was also done. As mentioned earlier, not all procedures found in a typical complete examination were always performed. Other tests that were commonly found in the records included color vision testing, stereo testing, and near (dynamic) retinoscopy.

The Streff syndrome diagnosis was not always made, per se, by the doctor doing the exam, but for the purpose of this study, Streff syndrome was diagnosed from the data and the results on the record of the exam. The criteria for the diagnosis of Streff syndrome was made when the patient exhibited the following symptoms:
1. Low refractive error (from -0.50 to +1.00 D, with less than .75 D of astigmatism).

2. Decreased acuity that was generally worse at near then at distance and not correctable in the distance with lenses (generally 20/40 at distance and 20/40 to 20/60, OD, OS, OU or worse at near was found). The decrease in acuity was not explained by refractive error or pathologic states.

3. Poor oculomotor pursuits, fixations and saccades.

4. Other visual disturbances were taken into account for the diagnosis of Streff syndrome, such as restricted confrontational fields and color vision anomalies.

5. The patient's subjective visual complaints were taken into consideration such as diplopia, headaches, close working distance.

Results

The review of the records showed that the majority of the patients had visual problems that could be related to refractive error alone (See Appendix A). Thirty were low to moderate myopes, and twenty-six were low to moderate hyperopes. Nine had a diagnosis of general binocular dysfunction such as convergence insufficiency and three had accommodative dysfunctions.

Five of the patients had been given diagnoses of Streff syndrome, and seven patients had visual disorders that match Streff
syndrome and were thus identified as having Streff syndrome in retrospect. Therefore, there was a total of twelve patients identified as having Streff syndrome. This represents 16.90% of the Christie School patients seen in the past three years. Of these, there were eight females (66.00%) and four males (33.00%). The average age of the patients with Streff syndrome was 14.09 years.

**Case Studies**

Four case studies of the patients diagnosed with Streff syndrome are presented, three of these patients I was able to test.

**Patient 1: AC**

AC is a fourteen year old female who was first seen at the office on July 22, 1997. On the patient information questionnaire she listed that she frequently experiences the following: “Blur up close, squinting, sleepy with reading, frequent loss of place when reading, reading held at ten inches or less and motion sickness from reading in a car”. Next to “eyes burn” on the form she wrote in “so-so”. She could not recall seeing a vision specialist before. Her health history includes asthma and allergies. She was taking three medications that are common to this population: Paxil (Paroxitine) 20 mg qd, for depression, Trazadone, 50 mg, hs, a sleeping aid, and Proventil inhaler, two puffs, prn.17-18 (For more information on these drugs and the side effects, see Appendix B.)

Entrance acuities without glasses were for distance OD 20/40, OS 20/50 and OU 20/40. Near acuities were OS 20/120, OD 20/120
and OU 20/120. Confrontational fields were slightly restricted, OS>OD. Pursuits were jerky and saccades showed motor overflow and undershoots. Cover testing at near and distance showed esophoria. Near point of convergence was eight inches with a recovery of 12 inches. On the Stereo-fly she could appreciate float, but could not see stereo on the circles. AC had complaints of double vision, especially when reading, and used a book mark to help her keep her place.

Static retinoscopy showed OD +1.00 D, OS +1.75 D with a “variable reflex.” In attempting to determine her subjective refraction, her acuities fluctuated from 20/70 to 20/20 with as little as a +/-0.25 D change. Her subjective refraction was recorded as -0.25 D OU with a range of 20/20- to 20/40 acuities. Her phoria at distance was 3 prism diopters (pd) esophoria and at near 5 pd exophoria. Vertical phoria was orthophoric. Convergence ranges were X/8/6 and divergence ranges were X/8/4. Negative relative accommodation was +2.50 D net and positive relative accommodation was-.50 D net. With +1.00 D at near point she could read 20/20 OD, OS, OU. Anterior and posterior health was excellent.

AC returned one week later for follow-up testing. Entering acuities were distance OD, OS 20/40 and near OD, OS 20/60. Dynamic retinoscopy was performed and varied from O.D. +0.50 to +1.00 D and OS + 0.50 to + 1.25 D. A Full Field 120 point visual field screening test was given. No ocular, pathological or neurological disease states could be determined from this test due to the high number of fixation losses with several false positive and false negative errors.
This is generally considered an “invalid“ test, but may be expected for this population. A diagnosis was made at this time of Streff syndrome. It was recommended that she start vision therapy, and +1.00 D readers were prescribed.

AC attended five one-half hour vision therapy sessions. (Vision therapy for these patients is paid for by the state, five one-half hour sessions is presently the maximum number of sessions allowed).

Vision therapy was initiated with a plan to improve visual skills such as tracking, pursuits and fixations. Therapy also included visual-motor integration (VMI) activities. Home vision therapy was assigned, but compliance was inconsistent. Throughout the vision therapy sessions, emphasis was placed on visual awareness.

The vision therapy plan consisted of the following:

Session 1: Computer Tracings and Computer Scan

Session 2: Wayne Maze, Parquetry: near and far and saccadiscope work.

Session 3: Computer VMI, Pepper Sort (visual-perceptual integration at near and far), Rotator and Pegs.

Session 4: Theta-Unit cards (for fusion training), Saccadiscope, Computer concentration.

Session 5: Parquetry: near and far, Computer search, Geo-board.

After five vision therapy visits AC returned for a progress evaluation. AC said that vision therapy, “Helped her learn where to focus her eyes.” Pursuits and tracking were smooth, near point of
convergence was 7”/10”. The plan was for her to continue to use her plus lenses for near work.

Throughout testing of AC, it was evident that she did not like ‘things’ near her face, whether it was a fixation target or the phoropter. This was a common complaint from many of the Christie School patients. This has implications not only for testing, but for designing a vision therapy program as well. Kitching, the vision therapist who often works with many of these patients in Dr. Wojciechowski’s office, stated that “many of these patients have been abused and have had their “personal space” violated.” It is therefore important to keep activities away from the patient’s face. Commonly used vision therapy tools such as flippers or stereoscopes are not appreciated by these patients. Instead vision therapy will be more successful when activities are kept at least 8” away from their faces.\[16\]

Patient 2: DE

DE is a 12 year old boy. He was first seen at the office on July 3, 1997. On the Visual Information questionnaire, he checked off the following visual complaints: Blur at distance, squinting, sleepy with reading, and frequent loss of place when reading. He was taking two medications; Clonidine, 0.1 mg qid and Diphenhydramine, 50 mgs hs. Although these drugs are generally used for high blood pressure and allergies, they are also widely used to treat withdrawal symptoms from addictions to drugs and as a sleeping aid.\[17-18\] (See Appendix B for drug side-effects).
His entrance acuities at distance without glasses were OD, OS, OU 20/30, and at near were OD, OS, OU 20/60. Pursuits were jerky, especially along the horizontal and when the midline was crossed. Saccades were quick and accurate. Confrontational fields were full. Cover testing showed orthophoria at distance and near.

Retinoscopy showed OD +0.25 D and OS plano. Best visual acuities were OD, OS, OU, 20/30, with +0.50 D sphere OU. Phorias through the subjective refraction were 2 pd exophoria at distance and 4 pd exophoria at near. Vertical phorias at distance and near were orthophoric. Cross cylinder findings were +1.00 D OU, with orthophoria. Convergence ranges were X/18/12 and divergence ranges were X/24/17. Anterior and posterior segments of the eye were healthy. A diagnosis of Streff syndrome was made and reading glasses of +0.75 D for near work were prescribed and he was asked to return to the office after wearing them for two weeks.

DE returned 10/13/97 for his follow-up visit. He stated that he liked his new glasses and he had been using them. His distance visual acuities were OD 20/20-1, OS 20/25+3 with difficulty, as he used his finger to point out the letters (on the distance Snellen chart). Visual acuities at near with the +0.75 D glasses were OD, OS, OU, 20/25 at 16 inches. He stated that, “The card is too far away and if it was closer I could read it.” When he was allowed to hold the near-point card himself, he brought the card to approximately 6” from his eyes. He could then read the 20/20 line, OU, without lenses. Near point of convergence was 8”/10” and cover tests at distance and near were orthophoric. The subjective binocular refraction was plano OD, OS, with acuities of OD, OS, OU 20/20.
Phorias were 2 pd exophoria at distance and 5 pd exophoria at near. The plan was to continue to use the plus lenses for all near work.

Patient 3: JD

JD was seen on 9/4/97. JD is a 17 year old female. A vision questionnaire was not filled out. She was taking .05 mg of Levo-T (Thyroxin) daily.

Distance unaided acuities were OD 20/40, OS 20/30 and OU 20/30-1. Near unaided acuities were OD 20/60, OS 20/60 and OU 20/40. When questioned about her vision she said that she notices that 'the floor seems to move'. She had complaints of seeing double. She suffers from frontal headaches approximately once per day, and the headaches get worse as the day progresses.

She often lost fixation during pursuit testing, especially superior and temporal fields. Saccades showed slight undershoots. Cover tests showed low exophoria at near and orthophoria at distance. Near point of convergence was 6”/4”. Static retinoscopy showed OD +0.50-0.50 x120, OS -0.50-.25x130. Subjective binocular refraction was OD +.25 D sphere and OS plano -0.50 x140 with visual acuities of OD, OS 20/40+ and OU 20/30. Distance phoria through the subjective refraction was 2 pd esophoria. Convergence ranges at distance were X/6/4 and at near were X/8/2. Divergence ranges were at distance X/6/0, and at near X/14/12. At this point in the exam the patient complained of a headache, and many of the tests were not finished. This maybe diagnostic in itself of general visual dysfunction. A diagnosis of Streff syndrome was made and a
prescription was given for +0.75 readers. She did not return for a follow-up visit, a common problem with this population.

Patient 4: CW

CW was a thirteen year old boy first seen in the office May 31, 1995. No entrance information questionnaire was filled out by this patient. He had complaints stating that distance vision was “blurry sometimes”. Unaided distance visual acuities OD and OS 20/30 and OU 20/30 +1. Near unaided acuities were OD, OS, OU 20/30. Pursuits were free, smooth and accurate. Saccades were quick and accurate. NPC was to nose. Cover test at near was exophoric and orthophoric at distance. Confrontational fields were full with no restrictions. Stereoacuity was 200 arc seconds and Ishihara color was 12/14.

Static retinoscopy showed -0.25 D OD, OS. Subjective visual acuity was OD, OS plano with visual acuities of OD and OS 20/30 and OU 20/25 described as “slow.” Negative accommodative stimulus was +1.00 D and total positive accommodative stimulation was -1.00 D. Phorias at distance and near were 2 pd exophoria. Convergence ranges at distance were X/12/0 and at near were X/18/2. Divergence ranges at distance were X/8/1 and at near were X/20/12. Vertical phorias were orthophoric. Binocular cross cylinder was +1.25 D with 7 pd exophoria. A diagnosis of general binocular dysfunction was made, although in retrospect this patient appears to have Streff syndrome.

CW was given a prescription for +0.75 D for reading and he started ten one half hour sessions of vision therapy. Vision therapy
emphasized improvements in just noticeable difference (JND), visual-motor integration, visual and body awareness, and accommodative facility and plus acceptance. The vision therapy sessions consisted of the following activities:

Session 1: Maze, Rotator and Pegs, Computer Visual Scan.
Session 2: Saccadiscope Near and far, Mother Goose vectogram, White Board Groffman.
Session 3: Hidden pictures with +1.00 D lenses, saccade work on the rebounder.
Session 4: Computer Net Rock with + 1.75 D lenses and saccadiscope.
Session 5: Pencil saccades, Brock String with prism jumps, JND work with +.75 D and 3 pd. Tracking work.

Up to this point in the therapy it was noted that attitude and compliance were poor. But something "clicked" for CW. The progress evaluation reads, "CW seems to have set his own "alarm" for his wake-up call. He's challenged by higher level integration i.e. increase in saccades on the rebounder, while saying same, doing opposite; focusing with +/- 1.75 D, noted SILO immediately. JND with 100% accuracy, OD and OS. A reminder was given that if attitude did not improve, vision therapy would be discontinued." After this session it was noted that "cooperation had greatly increased, and he had completed the vision therapy procedures before his time was up." The vision therapy sessions continued with:

Session 6: Perceptual work with +1.75, Computer VMI.
Session 7: VO series: Topper and Chicago and cherioscopic tracings. It was noted that during this session he was “motivated and interested in doing well.”

Session 8: Aperture Ruler with BI and BO; Bat Ball with a partner.
Session 9: Saccadiscope at near, Computer Visual Scan, Maze (hand held with ball).
Session 10: Saccadiscope at near, Computer Visual Scan, Maze (hand held with ball).

CW was re-tested for a progress exam on 7/19/95. Subjective refraction was OD, O.S. plano with visual acuities improved to OD, O.S. 20/20 and O.U. 20/15. Near visual acuities were O.D., O.S., O.U. 20/20-1. Subjectively the patient reported that he was, “Seeing better with reading. Words no longer run together. He no longer suffered from headaches.” He showed increased plus acceptance (+2.50 D) and total accommodative stimulation (of -3.25 D).

Summary

Streff syndrome is characterized by several concurrent visual conditions. Most significant is a bilateral decrease in acuity that is not correctable with corrective lenses or explained by pathology. This decrease in acuities is generally worse at near than at distance. The refractive errors are low, ranging from -0.50 to +1.00 D. Other facets of the syndrome include an extremely poor ocular motilities, fixations and saccades. Color vision anomalies and constricted fields are common.

In the population of the emotionally disturbed children of the Christie School there is a strikingly high prevalence (16.90%) of
Streff syndrome. The prevalence is 2.73 times higher when compared to children diagnosed with Streff syndrome in normal population of children visiting a clinic, as seen in Kowalski's prevalence study (6.2%).

It is also high compared to other studies of children with possible emotional conflicts, as in Mantyjarvi's study of children with psychogenic amblyopia with an prevalence of 1.75%.

Average age of the patients identified as having Streff syndrome from the Christie School is 14.09 years old, with a range of 12 to 17 years old. This is quite a bit higher than the average age found by Mantyjarvi of 10.2 years of age and 10 years in Kowalski's study. This difference may only reflect the average age of the patients from the Christie school which was 14.6 years old.

There are three explanations for the high prevalence rate of Streff syndrome in this population: (1) The difficulties in differential diagnosis between Streff Syndrome and malingering and hysterical amblyopia. (2) The effect of medications on this young population; and (3) Streff syndrome may be a reaction to a high level of emotional and psychological stress in a young persons life.

The characteristics of accommodative dysfunctions, general binocular dysfunctions, Streff syndrome, hysterical amblyopia and even malingering overlap so much that in many cases no clear-cut diagnosis can be made. No where is this dilemma more evident then with the patients of the Christie School. Part of the problem is that there is an overlap along a continuum of symptoms and diagnoses.

The issue of malingering in the differential diagnosis is an important one. Streff believed that "Children are not malingerers"
and of course he originally called his observations of visual dysfunctions ‘non-malingering syndrome’. The children of the Christie School are often difficult to work with for various reasons: fatigue, irritability, effect of medications, not liking testing instruments near their face, and poor attitude, to name a few. There certainly maybe an element of malingering on their part that may be conscious or unconscious. Hirsch concluded that the discussion of malingering was moot; “Whether the basis was malingering or hysteria seems to me to be of secondary importance... the children have reduced acuity consequent upon psychological problems.”

The effect of systemic medications that are used on the young patients to treat emotional disorders as well as other systemic problems all have ocular and visual side effects, but simply because a drug is listed as having a certain side effect does not necessarily mean that 100% of the population is effected. In reality, often it is only a few percent that are effected. But there is no doubt that some of the side effects can mimic or cause accommodative dysfunction, general binocular dysfunction and Streff syndrome. Also, although many of the children diagnosed with Streff syndrome from the Christie School were taking prescription medications, there was not one particular medication that was used by all of the patients.

It has been hypothesized in several previously published research papers that emotional and psychological stress in a young persons life can be an important etiology in Streff syndrome. Gilman reported on patients in his practice who were physically and sexually abused and were diagnosed with Streff syndrome, but no numbers were given to show the actual prevalence, and therefore
no positive association could be made. This study clearly shows that there is a high association between emotionally disturbed children who have been emotionally, physically and sexually abused and Streff syndrome.

Vision therapy and plus lenses at near appear to help the patients with Streff syndrome overcome some of the symptoms. A young patient with Streff syndrome appears to have "shut-down" their visual system. Vision therapy can help them become more aware of their visual world, thus helping them to reconnect themselves to the world around them. Vision therapy will help to reduce their headaches and dizziness and increase their ability to read and comprehend. Low plus lenses may relax the accommodative system that appears to be frozen or highly spastic. With vision therapy the patients learn accommodative flexibility and control needed to overcome the symptoms of Streff syndrome.

Conclusion

It is important for primary care optometrists to be alert to the signs and symptoms of Streff syndrome in the population of emotionally disturbed children, as well as in the many children who present at their practice. The children of the Christie School are already receiving psychological support and therapy and are surrounded daily by educators specially trained to work with them. But many other children may present with Streff syndrome in the optometrist’s practice,
and who may be suffering from a wide range of emotional stresses, from the emotional challenges of puberty to emotional, physical and sexual abuse. These children may not be getting the care they need and deserve. As primary care optometrists we must be ready to handle these situations, with the proper referrals and co-management to the appropriate health care providers, and possibly discussions with the child’s parents.\textsuperscript{11, 19}

As primary care optometrists, we are obviously not trained to deal with these children’s emotional or psychological issues, but we do have the power to make lasting changes in their visual lives, whether it be with low plus lenses, vision therapy, or with a few words of encouragement, and a sense of respect and understanding. Regardless of the multiple etiologies of the visual anomalies found in Streff syndrome in the population of emotionally disturbed children, steps can be taken to alleviate their symptoms and improve their visual abilities. In so many ways, these improvements may, in turn, improve their quality of life, and may even perhaps, improve their view of the world around them.
### Presence of Streff Syndrome in Emotionally Disturbed Children: Metzger Thesis

**APPENDIX A**

**PATIENT DATA BASE**

<table>
<thead>
<tr>
<th>#</th>
<th>Pt. Diagnosis</th>
<th>Age</th>
<th>Sex</th>
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Total number of patients: 71
50 F, 21 M

Myopia: 30
Hyperopia: 26
GBD, including CI: 9
AI, AD: 3

Number of patients diagnosed with Streff: 5 (7.04%)
Ratio of females to males: 3F, 2M
Number of patients identified retrospectively with Streff: 7
Ratio of females to males: 5F, 2M
Total number of Streff syndrome patients + retrospective identified as Streff: 12 (16.90%)
Total per cent of females Vs. males with Streff Syndrome:
8F (66%), 5M (33%)

Key:
M=myopia
H=hyperopia
A=astigmatism
GBD=General Binoc Dysfunction
CI=convergence insufficiency
AI= accommodative insufficiency
AD=accommodative dysfunction
S= Streff syndrome (actual diagnosis on record)
R.S.= retrospective identified as streff syndrome (based on criteria outlined in paper)
Appendix B

Ocular Side Effects of Medications Commonly Used by Patients of Christie School

Note: (Top 3 (or more) side effects are listed)

Azmacort (generic: triamcinolone):

**Primary Use:** Inhaler used for treatment of asthma.

**Ocular side effects:** 1. Posterior subcapsular cataracts, 2. Elevated Intraocular pressure, 3. Optic nerve damage and 4. Papilledema which is associated with pseudotumor cerebri.

Tagamet (generic: cimitidine):

**Primary Use:** Histamine H2 receptor antagonists used in the treatment of duodenal and stress ulcers.

**Ocular side effects:** 1. Decreased vision, 2. Visual hallucinations, (when given in high doses and in the elderly), 3. Photophobia.

Diphenhydramine:

**Primary Use:** Ethanolamine antihistamine used in the symptomatic relief of allergic or vasomotor rhinitis, allergic conjunctivitis, and allergic skin conditions.

Eskalith: (generic: Lithium Carbonate):

Primary Use: This lithium salt is used in the management of the manic phase of depressive psychosis.


Levo-T: (generic: levothyroxine):

Primary Use: Thyroid hormones are effective in the replacement therapy of thyroid deficiencies such as hypothyroidism and simple goiter. Dextrothyroxine is also effective in the management of hypercholesterolemia.


Clinical significance: Serious CNS adverse effects, including psychosis with hallucinations, have appeared soon after initiation of thyroid replacement therapy in hypothyroid patients with a history of underlying psychiatric disorder. Pre-pubertal and peri-pubertal hypothyroid children may be susceptible to pseudotumor cerebri when beginning levothyroxine-replacement therapy.
Ortho-cyclen (Combination products of estrogen and progestogens):

**Primary Use:** Hormonal agents used in treatment of amenorrhea, dysfunctional uterine bleeding, premenstrual tension, dysmenorrhea, hypogonadism, and most commonly, oral contraceptives.


Paxil (generic: paroxetine):

**Primary Use:** Used for the treatment of depression.

**Ocular side effects:** 1. Blurred vision has occurred in 5% of patients treated with paroxetine. 2. Mydriasis, 3. Anisocoria (reported in one individual).

Perphenazine:

**Primary Use:** Phenothiazines are used in the treatment psychoses and schizophrenia. There are many kinds of phenothiazines, and not all side effects have been reported for each.

**Ocular side effects:** 1. Decreased vision, 2. Decreased or paralysis of accommodation, 3. Night blindness, 4. Problems with color vision (red-green defect).
**Primary Use:** Piperidine derivative is used in the treatment of mild depression and in the management of children with attention deficit disorder.

**Ocular side effects:** (Note: Ocular side effects are rare) 1. Eyelids and conjunctiva: a. urticaria, b. Erythema multiform, c. Stevens-Johnson.
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17. Wojciechowski N. Pharmacist, St.Vincent Hospital, Portland, OR. Per. commun. 11/97.
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