INTRODUCTION

An editorial on the Streff syndrome discussed a "gray area concerning malingering, Streff Syndrome and hysterical amblyopia."1 This prompted us to carefully review the literature, and we found ambiguity in the definition and clinical findings constituting the diagnosis of the Streff syndrome. Furthermore, we could find no agreement as to the name of this syndrome, e.g., juvenile bilateral functional amblyopia, Streff syndrome, non-malingering syndrome, or early adaptive syndrome. However ambiguous the definition may be, there is consensus among many behavioral optometrists that this syndrome is a clinical entity, separate from either hysterical amblyopia or malingering.

The purpose of this article is to present an historical perspective of the diagnostic characteristics of Streff syndrome. A differential diagnostic approach to delineating malingering, hysterical amblyopia, and Streff syndrome is outlined. Management considerations for each of these conditions are discussed.

HISTORICAL REVIEW

Visual disturbances of psychogenic origin were reported by the ancient Greeks.2 The word "hysteria" comes from the Greek word hystereikos, which means "suffering in the womb."3 It was not until the late 19th century that Charcot first demonstrated that hysteria occurred in males as well as females.2 Babinski theorized that visual manifestations of hysteria were "caused by suggestion and cured by persuasion."4 Freud, in 1910, postulated that visual disturbances were a physical manifestation of subconscious emotional turmoil of sexual origin (primarily involving the oedipal complex), a conversion reaction.5

Descriptions of the visual characteristics of hysterical amblyopia and malingering appeared periodically in the literature in subsequent years.6–13 There was much interest in the nature of hysterical amblyopia and malin-
gering during World War II, because many cases were reported in soldiers.\textsuperscript{14–20}

In 1961, Streff\textsuperscript{21} introduced his observations of a "nonmalingering syndrome" at the Eastern Seaboard Conference on Visual Training and Theoretical Optometry; however, he made no reference to hysterical amblyopia or conversion reaction. The three basic criteria of the nonmalingering syndrome were (1) reduced distance acuity (20/25 or much worse); (2) refractive status of plano to +1.00 diopters (D); and (3) no change in distance acuity with corrective lenses. Streff stated: "Gross physical and emotional disturbances were ruled out in a majority of cases studied." (These are included in hysterical amblyopia.) Other common characteristics were a history of lowered school achievement within a year of the examination, reduced near acuity (20/40 to 20/80), an abnormally near working distance, presence of a lag of accommodation at near, and reduced fusion ability in a Brewster stereoscope.

These cases were managed with lenses of low-plus (+0.25 to +0.75 D) in either single vision or bifocal form. These lenses reportedly produced a marked improvement in school achievement, as well as improved distance vision and almost complete relief of asthenopia and headaches.

In 1963, Apell and Streff wrote a series of papers for the Optometric Extension Program.\textsuperscript{22–30} They discussed Streff's "nonmalingering" syndrome, as well as an "early adaptive syndrome" (EAS), supposedly related to Streff's syndrome, at great length. EAS is characterized by early changes in the "visual reorganization to meet adverse visual stress." According to the authors, this is a precursor to the nonmalingering syndrome. The main difference in EAS is that distance visual acuity is only slightly affected, but near visual acuity is significantly reduced. The authors provided various case examples of these conditions, as well as theoretical conjecture concerning their development.\textsuperscript{22–30}

Without referring to the earlier work of Streff and Apell, in 1965, Hirsch\textsuperscript{31} described a type of functional amblyopia which he thought had a psychological origin and was related to "social deprivation." He reported eight cases which, at first glance, had the characteristics of Streff's nonmalingering syndrome, as follows: (1) reduced distance visual acuity (20/40 to 20/400); (2) hyperopic refractive error of 1.50 D or less (with no more than 0.50 D of astigmatism). Hirsch found immediate improvement of visual acuity (20/20) with lenses that neutralize the refractive error and with plano lenses on repeated testing. This indicates that Hirsch's amblyopic cases had a psychogenic origin, either malingering or hysterical. (This is apparently in contrast to the Streff syndrome.)

Further studies were conducted to determine whether there was a common psychological condition present in subjects in whom hysterical amblyopia or conversion reaction had been diagnosed.\textsuperscript{32–34} There was no uniform psychological or personality pattern, and the precipitating stress seemed to be more important. There have been subsequent postulations of neurotic conflict,\textsuperscript{35} and the stress of prepuberty and puberty.\textsuperscript{36}

Streff's nonmalingering syndrome was referred to as the "Streff Syndrome" by Gilman in 1979 and 1981.\textsuperscript{37,38} He differentiated the Streff syndrome from hysterical amblyopia on an etiological basis.\textsuperscript{38} Gilman contended that hysterical amblyopia has a primary psychological etiology, and the Streff syndrome is primarily an "autonomic nervous system disorder" caused by an "accommodative response to close work."\textsuperscript{37,38} Whereas hysterical amblyopia has secondary visual signs and symptoms, Streff syndrome supposedly has secondary psychological signs and symptoms. Gilman's description of the syndrome closely resembles that of EAS\textsuperscript{22–30} with the addition of reduce stereoacuity (50 seconds or worse), "aberrant" visual fields (often constricted or spiraling), and a "pseudo-color vision deficiency" also being likely (see Table 1). However, all these signs and symptoms are not found in all cases of Streff syndrome. Gilman emphasized that a differential diagnosis was necessary because the successful treatment modalities were different. A psychological consultation would be indicated for a patient with hysterical amblyopia; the application of low-powered plus lenses combined with vision training would be the most efficacious treatment for a patient with Streff syndrome.

Streff presented a study in 1981\textsuperscript{39} of chil-
TABLE 1. Initial Clinical Findings with Streff Syndrome

<table>
<thead>
<tr>
<th>Testing Area</th>
<th>Apell/Streff</th>
<th>Gilman</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>No physical or emotional disturbances</td>
<td>No emotional stress</td>
</tr>
<tr>
<td>Snellen acuity</td>
<td>20/25 or worse (May be worse than distance)</td>
<td>20/25 or worse</td>
</tr>
<tr>
<td>Distance</td>
<td></td>
<td>Worse than distance</td>
</tr>
<tr>
<td>Near</td>
<td>Plano to +1.00 D &lt;0.50 astigmatism</td>
<td>Low refractive error, usually low</td>
</tr>
<tr>
<td>Distance retinoscopy</td>
<td>Significant lag</td>
<td>hyperopia</td>
</tr>
<tr>
<td>Dynamic Near Retinoscopy</td>
<td></td>
<td>NR</td>
</tr>
<tr>
<td>Fixation</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Pursuits</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Color vision</td>
<td>NR</td>
<td>Distorted</td>
</tr>
<tr>
<td>Visual fields</td>
<td>NR</td>
<td>Bilateral contraction or spiraling</td>
</tr>
<tr>
<td>Stereoacuity</td>
<td>Reduced</td>
<td>Reduced</td>
</tr>
<tr>
<td>Reading distance</td>
<td>Too close</td>
<td>Too close</td>
</tr>
<tr>
<td>Accommodative amplitudes</td>
<td>NR</td>
<td>NR</td>
</tr>
</tbody>
</table>

NR = not reported.

dren in whom Streff syndrome had been diagnosed. The study used the basically accepted criteria for the diagnosis. In addition to the usual testing, all subjects were tested for oculomotor control functions including fixation, spontaneous two-position saccadic eye movements, ocular rotations, and reading under three optical conditions: (1) no lenses, (2) low-plus powered lenses, and (3) low-minus powered spheres. These oculomotor functions were evaluated with an electro-oculogram (EOG). The subjects were then given either low-plus spherical lenses (ametropia apparently not taken into account) with “guidance treatment” or no lenses with guidance treatment. Guidance treatment consisted of “demonstrating the difficulty of ocular-motor control to the subject” by allowing the subject to observe EOG recordings. This was done to demonstrate to the child that “… to some extent, he could affect ocular stability and movement.”

The study demonstrated that all the subjects had poor fixation ability (symmetrical drifts left and right) and oculomotor control. Treatment was most successful with the application of low-plus powered lenses; all significant abnormal findings were normalized. Streff also recommended vision training in addition to therapeutic lenses, because “the visual stress is still present even when they are wearing the lenses.”

DIFFERENTIAL DIAGNOSIS

Hysterical amblyopia and reduced visual acuity caused by malingering have been described, diagnosed, and documented with case reports since the middle of the 20th century. In any case of reduced visual acuity, a careful differential diagnostic approach is necessary to determine whether or not the cause is organic. Amos summarized this differentiation with results of six clinical tests: pinhole acuity, near versus far visual acuity, whole chart versus isolated letter acuity, swinging flashlight test, photostress procedure, and the Amsler grid. Improved acuity with a pinhole suggest uncorrected ametropia and rule out hysterical amblyopia or ocular disease. Near and far visual acuities would be inconsistent only in cases of hysterical amblyopia or malingering. Acuity would improve only in strabismic or anisometropic amblyopia with isolated letters. The swinging flashlight test would be used to diagnose optic nerve disease, as would the photostress test and amsler grid for macular disease.

The optometric tests or characteristics used in differential diagnosis of the conditions of malingering, hysterical amblyopia, and Streff syndrome are presented in Table 2. These characteristics represent typical responses; however, there may be variations in
TABLE 2. Differential Diagnosis

<table>
<thead>
<tr>
<th>Test or Characteristic</th>
<th>Malingering</th>
<th>Hysterical Amblyopia</th>
<th>Streff Syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (ratio)</td>
<td>Nonspecific (1:1)</td>
<td>Female (2:1)</td>
<td>Female (2:1)</td>
</tr>
<tr>
<td>Age</td>
<td>Any</td>
<td>8–14 y</td>
<td>6–12 y</td>
</tr>
<tr>
<td>Attitude</td>
<td>Hostile</td>
<td>Detached</td>
<td>Amiable</td>
</tr>
<tr>
<td>Involved eye(s)</td>
<td>Unilateral or bilateral</td>
<td>Bilateral</td>
<td>Bilateral</td>
</tr>
<tr>
<td>Accommodation</td>
<td>Normal</td>
<td>Possible spasm</td>
<td>Unstable lag</td>
</tr>
<tr>
<td>Visual fields</td>
<td>Implausible/restricted</td>
<td>Implausible/restricted</td>
<td>Implausible/restricted</td>
</tr>
<tr>
<td>Ocular health</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Various complaints</td>
<td>Recent onset of significantly blurred vision</td>
<td>Difficulty in school</td>
</tr>
<tr>
<td>Stereoaucity</td>
<td>Normal (with surreptitious testing)</td>
<td>Reduced</td>
<td>Reduced</td>
</tr>
<tr>
<td>Color vision</td>
<td>Normal responses</td>
<td>Normal responses</td>
<td>Unreliable responses</td>
</tr>
<tr>
<td>Mobility</td>
<td>Exaggerated difficulty</td>
<td>Normal</td>
<td>Possible clumsiness</td>
</tr>
</tbody>
</table>

NOTE: Visual acuity testing results at both far and near are not consistently reported in the literature for hysterical amblyopia or malingering. Therefore, comparison of these test findings cannot be made for purposes of this table.

Of the five mismatched characteristics revealed in Table 3, accommodative and color vision testing responses are easy to quantify, as opposed to attitude, symptoms, and mobility. Color vision has reportedly been normal in patients with hysterical amblyopia, but there is some “distortion” of color perception in Streff syndrome that causes unreliable responses to testing. Of a patient with Streff syndrome, near dynamic retinoscopy (monocular estimate method or book retinoscopy) will usually show a lag of accommodation of +0.75 D or more. In contrast, patients with hysterical amblyopia have been reported to exhibit either accommodative spasm or paralysis occasionally, although testing methods for this diagnosis have not been disclosed.

TABLE 3. Analysis of Similarities and Differences in Malingering, Hysterical Amblyopia, and Streff Syndrome

<table>
<thead>
<tr>
<th>Matched Conditions</th>
<th>Frequency</th>
<th>Mismatched Conditions</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = B</td>
<td>3</td>
<td>A ≠ B</td>
<td>8</td>
</tr>
<tr>
<td>A = C</td>
<td>2</td>
<td>A ≠ C</td>
<td>9</td>
</tr>
<tr>
<td>B = C</td>
<td>6*</td>
<td>B ≠ C</td>
<td>5*</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>Total</td>
<td>22</td>
</tr>
</tbody>
</table>

Key: A = malingering; B = hysterical amblyopia; C = Streff syndrome.

Of: Gender, age, bilateral, visual fields, ocular health, and reduced stereoaucity.

Attitude, accommodation, symptoms, color vision, and mobility.

DISCUSSION

Definitions can be formulated from the cluster of clinical characteristics delineated for the conditions of malingering, hysterical amblyopia, and Streff syndrome. On a theoretical basis, differential diagnosis involves the determination of etiology. Is the vision loss primarily a simulation of a vision loss (malingering), a result of emotional/psychological problems (hysterical amblyopia), or the result of primary visual problems (Streff syndrome)? From a clinical, practical view, however, differential diagnosis is often very difficult. Many patients have clinical signs and symp-
toms which could be applicable to all three of these conditions.

For example, we examined a 10-year-old girl with a history of poor school performance coupled with a recent onset of blurry vision while reading. During the examination, she exhibited unreliable responses on accommodative testing, stereoacuity testing, and color vision testing; and she gave variable restricted visual field results. Based on these results, a case could be made for a diagnosis of Streeff syndrome. On the other hand, this patient could have had hysterical amblyopia. Furthermore, we were not satisfied that malingering could be ruled out completely. Repeated testing was necessary to determine the exact diagnosis. A follow-up examination revealed that the patient had a detached attitude (seemingly not bothered by the vision loss) and there were primary emotional problems uncovered on repeated and more extensive family history. In our professional opinion, this was a case of hysterical amblyopia.

This case notwithstanding, we believe that primary vision problems can sometimes produce psychological problems, as described by Streeff. Therefore, in our opinion, the Streeff syndrome can be a distinct entity in some cases. However, in most cases as more information is obtained about the patient from optometric examination (as well as from other professionals), the probable diagnosis becomes one of malingering and/or hysterical amblyopia.

Pertaining to Streeff syndrome, Bosse's 1stated, "In most cases the problem is associated with some stress factor: separation of parents, death of a family member, problems with other children or at school, and no significant psychosis exists." This list of psychological stress factors can certainly cause the signs and symptoms common to Streeff syndrome. In such cases, there is a psychogenic etiology such as that causing hysterical amblyopia, rather than the other way around (ie, vision problems preceding the psychological ones). Furthermore, hysterical amblyopia (conversion disorder) has an ICD-9-CM code of 300.11.5 The 300 series is for nonpsychotic disorders. Bosse's implication that hysterical amblyopia requires a "significant psychosis" disagrees with the weight of authority.

In cases of Streeff syndrome, lenses and vision training may be recommended. With hysterical amblyopia or malingering, psychological consultation should be recommended, although a lens prescription and vision training may also be appropriate in conjunction with psychotherapy in some cases. Optometric treatment, however, should not be the sole approach to the management of such cases with psychogenic origin. It is important to understand that visual disturbances attributed to hysterical amblyopia are not abated quickly and easily, even with appropriate psychiatric intervention. 34,35,44,46,47 On the other hand, we have found that vision therapy has helped abate visual problems in many patients who presumably had Streeff syndrome.

REFERENCES


