Nonorganic (Psychogenic) Visual Loss in Children: A Retrospective Series

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Background: Few studies provide follow-up information or systematic investigation of prognostic parameters of nonorganic (psychogenic) visual loss in children.
Methods: A retrospective case series analysis was performed on 58 patients younger than 16 years old who had nonorganic visual loss and underwent at least a 3-month follow-up clinic visit and/or telephone interview between 1992 and 2007 at a single institution in Italy. All patients underwent a full neurologic, ophthalmologic, and orthoptic evaluation. Visual electrophysiologic tests were performed in many patients as part of the evaluation. Neuroimaging was performed and psychiatric referral was made only as needed. We collected data on the age at onset, time to diagnosis of nonorganic visual loss, type and duration of visual symptoms, and concomitant psychologic or psychosocial difficulties.
Results: Visual deficits consisted mostly of reduced visual acuity (76%) and visual field defects (48%). The diagnosis of nonorganic visual loss could be reached with confidence by means of observing inconsistent performance on a wide array of visual function tests, and, in doubtful cases, by means of electrophysiologic investigations. The mean time from onset to diagnosis was 3.1 months. The mean duration of visual symptoms from reported onset to disappearance was 7.4 months. Complete resolution of all visual symptoms occurred in 93% of patients and did so within 12 months of diagnosis in 85% of patients. There was no correlation between the duration of visual symptoms and age at onset, sex, time to diagnosis, type of ocular symptoms, or presence of psychosocial or psychologic difficulties.
Conclusions: Our study extends the follow-up information and confirms the findings of previous investigators in showing that nonorganic visual loss in children generally resolves spontaneously within 1 year and that no major psychiatric disorders are present or will appear after diagnosis. However, psychosocial stressors are often present and may predispose to this manifestation. There are no obvious predictors of rate of recovery.

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Nonorganic (psychogenic) visual loss in children, which makes up 1%–5% of a general ophthalmology practice (1,2) is defined as an apparent abnormality of visual function not confirmed by identifiable damage of the visual pathways (3). The diagnosis, often a lengthy process (2,4,5), is based on inconsistent performance on a wide range of visual function tests and, in doubtful cases, on electrophysiologic investigations confirming integrity of the visual pathways (2,4,6).

Few studies provide adequate follow-up information or systematic investigation of parameters that predict rate of recovery (1–4,6–18). The purpose of this study was to investigate the clinical characteristics, outcome, and prognostic indicators in a large series of children who received this diagnosis at a single institution.

METHODS

This was a retrospective study of 58 patients under 16 years old who had nonorganic visual loss and who had a follow-up examination at least 3 months later in the Pediatrics Department of Padua Hospital between 1992 and 2007. Patients with coexisting ocular pathologic conditions were included only if the nonorganic visual loss diagnosis was firm.

Parents or guardians were contacted by telephone in early 2008 for follow-up information by a board-certified child neurologist. The study protocol and consent forms were approved by the hospital's institutional review board. Once the history and physical examination indicated the

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suspicion of a nonorganic disorder, neurologic, ophthalmologic, and orthoptic evaluations were undertaken. The ophthalmologic evaluation included determination of visual acuity for distance and near viewing by Snellen charts, Lea symbols, Early Treatment Diabetic Retinopathy Study (ETDRS) charts, and Teller acuity cards, refractive error determination by dynamic and cycloplegic refraction, visual field examination by Goldmann perimetry, color vision testing by Ishihara plates and Farnsworth D15, contrast sensitivity testing with the Pelli-Robson chart, fogging, polarizing lens, optical penalization test and mirror tests, pupillary reactions, anterior segment examination by slit lamp, and ophthalmoscopy. The orthoptic evaluation consisted of binocular vision (Worth 4 dot), cover, and stereoacuity (Lang II, Titmus) tests.

The diagnosis of nonorganic visual loss was based on inconsistent results of wide-ranging measurements of visual acuity and other visual abilities. Electrophysiologic investigations, including flash and pattern visual evoked potentials (pVEPs) and electroretinography, were undertaken in doubtful cases. Neuroimaging was performed only in selected patients. Once nonorganic visual loss was diagnosed, a consultation was held with parents to assure them that the child had no underlying organic illness.

Adequate follow-up data were obtained for 56 of the 58 patients. An ophthalmologist reevaluated 43 (74%) patients with a mean time from symptom onset of 7.3 months (range 1–60 months). Forty-two subjects (72%) agreed to participate in the follow-up telephone interviews with a mean time from symptom onset of 4.4 years (range 0.5–16 years). Thirty-one patients (53%) received an ophthalmologic reexamination and a clinical telephone interview. The following data were collected: age at onset, sex, type of visual symptoms, duration of symptoms before clinical diagnosis of nonorganic visual loss (time to diagnosis), duration of visual symptoms from reported onset to reported disappearance, duration of follow-up, presence of preexisting eye disease, associated symptoms, and concomitant psychologic or psychosocial difficulties.

Data analysis was performed using an Italian statistical software package (Statistica). By means of logistic regression, the following potential ''risk factors'' (see Table 2) were tested with respect to their effect on the duration of visual symptoms: 1) age at onset, 2) sex, 3) time to diagnosis, 4) type of ocular manifestation, 5) associated nonocular symptoms, and 6) concurrent problems. The type of ocular manifestation included visual acuity defects, visual field defects, blurred vision, diplopia, dyschromatopsia, ocular pain or burning, and amaurosis (quantitative variables). Visual acuity defects were grouped into 2 dichotomous variables: unilateral/bilateral and severe ($\leq$20/40)/mild (>20/40). Visual field defects were differentiated into 1 dichotomous variable: unilateral/bilateral. Concurrent problems were considered either individually or clustered in 4 main groups. The log-rank test and Cox regression model were used, respectively, for dichotomous and quantitative variables. In particular, we investigated whether psychosocial or psychologic problems contributed to longer duration of symptoms. The data were examined by 2 board-certified child neurologists and by a statistician.

RESULTS

Fifty-eight patients were identified as having nonorganic visual loss. Inconsistent visual acuity testing was present in 55 (95%) of patients. The most reliable method for detecting nonorganic visual loss was the finding that a very low visual acuity did not match a determination of a normal stereoacuity.

Among the 58 patients, 39 (67%) were girls and 19 (32%) were boys, with a female-to-male ratio of 2:1. Age at onset ranged from 5.3 to 15.5 years (mean 9.6 years, SD 2.4, mode 10). Time to diagnosis from the onset of symptoms was less than 1 month in 35 (60%) patients and more than 12 months in 2 (3%) patients (mean 2.8 months). Nine patients had been evaluated elsewhere by ophthalmologists and referred to us for neurologic evaluation because of a clinical suspicion of optical neuritis.

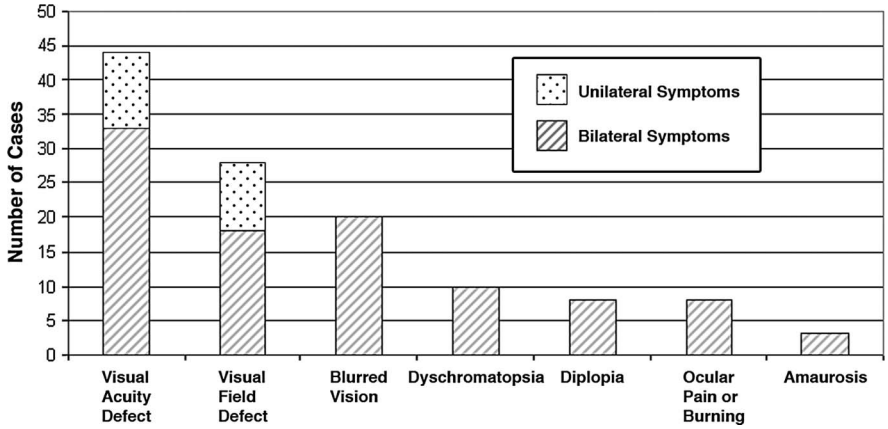

FIG. 1. Visual symptoms and signs in 58 children with nonorganic visual loss.

Subnormal visual function measurements consisted of reduced visual acuity in 76% and visual field defects in 48% (Fig. 1). In this group, 71% reported bilateral symptoms. Visual acuity reduction was severe (≤20/40) in 34 patients, and mild (≥20/40) in 10 patients. Visual field defects had been found in 28 (48%) of patients, consisting of concentric defects in 9 (33%), and were associated with reduced visual acuity in all but 1 patient. The location and size of the visual field deficits changed in sequential testing sessions in all but 1 patient.

The most commonly associated complaints were headache in 31 patients, abdominal pain in 14 patients, and limb pain in 4 patients. Eight patients (14%) had preexisting ocular pathologic conditions, which consisted of refractive errors (4 patients), retinopathy of prematurity (1 patient), strabismus (1 patient), accommodative esotropia (1 patient), and amblyopia (1 patient).

Visual electrophysiologic tests (Table 1), undertaken in 44 patients (76%), were normal in all but 1 patient, who had unilateral amblyopia and a unilateral abnormal pVEP with a normal electroretinogram. Results of neuroimaging (Table 1), performed in 22 patients (38%), were normal in all patients except 1, who had had a temporal lobe low-grade astrocytoma surgically excised before the onset of nonorganic visual loss.

Forty (69%) patients reported a stressful event considered to be a predisposing factor to the nonorganic visual loss, including family problems (24 patients) or psychologic difficulties (24 patients) (Table 2). In 8 patients a preexisting physical illness, including asthma, hepatic disease, autoimmune disease, and cerebral neoplasm, was reported.

Among the 7 patients referred to a child psychiatrist for evaluation after the diagnosis of nonorganic visual loss, 2 received a new psychiatric diagnosis. Among the 56 patients for whom follow-up data were available, 54 (93%) had complete resolution of all visual symptoms. The duration of visual symptoms ranged from 3 days to 48 months (mean 7.4 months). Symptoms resolved within 6 months in 31 (53%) and within 6–12 months in 12 (20%) and lasted more than 12 months in 9 (15%). To date, 4 patients continue to report visual symptoms, although they are now described as having a lower intensity and are fluctuating rather than persistent. One patient had a relapse 5 years after symptom onset, but neuro-ophthalmologic evaluation reconfirmed the diagnosis of nonorganic visual loss, based in part on normal neuroimaging. We found no statistically significant correlation between the duration of symptoms and the putative "risk factors."

TABLE 1. Electrophysiologic and neuroimaging studies among 58 patients with nonorganic visual loss

Study	N (%)
Electrophysiologic	44 (76)
Pattern visual evoked potentials	37 (64)
Flash visual evoked potentials	35 (60)
Electroretinography	15 (26)
Neuroimaging	22 (38)
CT	1 (2)
CT + MRI	5 (9)
MRI	16 (27)

DISCUSSION

The clinical features of nonorganic visual loss in children in this series are similar to those in previous publications (1,4,7–10). The 2:1 prevalence of girls and the mean age at onset of 9.6 years are consonant with past series (1,4,7–10). Conversion disorder was rare under 6 years of age (14%), as noted previously (9). The main manifestations were bilateral visual acuity defects (76%), often accompanied by bilateral visual field defects, (71%), as reported previously (2,4,7–10). Isolated visual field defects with normal acuity, reported previously in 15% of patients (2), were not found in our series. Many patients complained of additional nonocular symptoms, as described by others (7,8,10).

Preexisting ocular disease (3,8,10), family problems, and difficulty in school were prominent as in a previous series (7). The existence of nonorganic visual loss did not appear to imply important psychopathology or an increase in the risk of later psychiatric disorders (1,2,8,10).

Follow-up information, not widely available in previous reports (7,8,11,14,18) (Table 3), is a contribution of this study. Nearly all patients (93%) eventually showed total remission of the visual complaint. This proportion is higher than the range of 45% to 78% reported previously (1,2,5,7,15-17).

In our series, 73% of patients had recovered within 1 year. In comparison, the largest pediatric series reported

TABLE 2. Concurrent psychosocial or psychologic difficulties

Concurrent Difficulties	n (%)
Problems in the family	24 (41)
Parental psychiatric or severe physical disease	12 (21)
Death of a relative	9 (16)
Parental separation/divorce	3 (5)
Sibling birth or jealousy	7 (12)
Strict parents	5 (9)
Adoption	2 (3)
Problems at school	17 (29)
Psychologic problems	24 (41)
Poor self-esteem	12 (21)
Difficulty in peer socialization	10 (17)
Mood disorders	5 (9)
Binge eating disorders	2 (3)
Behavioral disorders	1 (2)
Preexisting physical illness	8 (14)

TABLE 3. Publications with follow-up information on nonorganic visual loss in children

Reference	Patients	Age Range (y)	Gender (Girls/Boys)	Patients with Follow-up Information	Duration of Visual Symptoms	Documented Clinical Resolution
Behrman and Levi, 1970 (19)	11	7–14	10:1	8	2–48 mo	4
van Balen and Slijper, 1978 (14)	31	8–16	24:7	28	mean: 20 mo	16
Mäntyjärvi, 1981 (11)	52	7–18 (mean 10.2)	48:4	46	3–46 mo	33
Catalano et al, 1986 (7)	23	6.5–17 (mean 11)	16:7	23	1 days–3 y (mean 2 mo)	22
Bain et al, 2000 (10)	30	6–15 (mean 10)	18:12	30	1 day–3 y (mean 7 mo)	30
Lim et al 2005 (8)	56	7–17 (mean 13.4)	40:16	13	NI	54
Present study, 2008	58	5.3–15.5 (mean 9.6)	39:19	56	3 days–48 mo (mean 7.4 mo)	52

Reference	Time of Resolution	Persistence of Symptoms (%)	Recurrence of Symptoms	Identifiable Stressful Events	Follow-up Duration
Behrman and Levi, 1970 (19)	<12 mo: 73%	NI	NI	NI	O: mean 16 m
van Balen and Slijper, 1978 (14)	NI	12 (39%)	NI	NI	O: 1 m–4 y
Mäntyjärvi, 1981 (11)	<12 mo: 37%	13 (25%)	NI	4/52 psychologic	O: 1–4.5 y
Catalano et al, 1986 (7)	<24 h: 35%<1 mo: 61%<2 mo: 74%	1 (4%)	1	39% school; 35% family	TI: 1–67 m (mean 34 m)
Bain et al, 2000 (10)	NI	0	NI	60% S (school or family)	O: NI
Lim et al 2005 (8)	NI	2 (3%)	NI	43% S	O: 1–60 m (mean 31.5 m)
Present study, 2008	<6 mo: 53%6–12 mo: 20%>12 mo: 15%	4 (7%)	1	69% S; (29% school; 41% family)	O: 1–60 m (mean 7.3 m); TI: 0.5–16 y (mean 4.4 y)

NI, no information; O, ophthalmologic follow-up; S, stressors; TI, telephone interview follow-up.

before ours (11), containing outcome information on 46 of 52 patients, found that only 37% of patients had recovered within 1 year.

Up to 40% of children with nonorganic visual loss have been reported to have visual deficits from 1 to 4 years after initial presentation (1,11). In our series, 15% of patients had symptoms lasting for 12 months or longer and 7% of patients still complained of visual symptoms at the last follow-up visit, although they were less intense and fluctuating rather than persistent.

Prognostic indicators for rapid resolution in previous reports (15,16) have included younger age at onset and absence of any associated psychiatric disease. Our study agreed with 1 former study (7) reporting that there was no correlation between the duration of symptoms before evaluation and subsequent recovery time. However, unlike other studies (15,16), our series showed that neither the age at onset nor the presence of a preexisting or newly diagnosed psychiatric disorder affected the speed of recovery.

We conclude that the best way to uncover nonorganic visual loss is the finding of inconsistency in results over a wide-ranging series of measurements of visual acuity and other visual abilities. The electrophysiologic investigations may confirm the integrity of the visual pathways mainly in doubtful cases (2,4–6,9); therefore, we recommend their use in nonorganic visual loss cases. The mainstay of management is reassurance that a full visual recovery is expected (4–6,9). Psychiatric referral is usually not necessary (1,2,8,10). Most patients will have early resolution of nonorganic visual loss, but there are no clinical parameters that can reliably predict how fast that will occur.

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