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Strabismus. Author manuscript; available in PMC 2009 June 20.

Published in final edited form as:
Strabismus. 2006 September ; 14(3): 147–150. doi:10.1080/09273970600894716.

An Office-based Scale for Assessing Control in Intermittent Exotropia

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Abstract

Introduction—Although intermittent exotropia may deteriorate with time, there are no widely accepted criteria for measuring progression in this disorder. The purpose of this study was to prospectively evaluate a new scale for assessing the level of control in children with intermittent exotropia.

Methods—Thirty consecutive pediatric patients (< 14 years) with intermittent exotropia were prospectively evaluated from July 1, 2004, through June 30, 2005, using a new scale to assess the level of control for both distance and near fixation. The distance score (0 to 5) was combined with the near score (0 to 5) to yield an overall control score from 0 to 10.

Results—The 30 patients were examined at a median age of 72 months (range, 15 months to 13 years). The level of control at distance was worse than or equal to the near level of control in all 30 patients. The control scores ranged from 0 to 5 for distance and 0 to 4 for near, with an overall control score range from 0 to 8 (median of 3).

Conclusions—This new scale for assessing control in children with intermittent exotropia can be easily applied in the office setting and characterizes the wide range of control in this disorder.

INTRODUCTION

Intermittent exotropia is the most common form of exodeviation[1,2] and is more prevalent than esotropia in some populations.[2] Although a common disorder that may deteriorate and become constant with time, there are no currently accepted criteria to guide the clinician as to the most appropriate time for intervention. Following the magnitude of the exotropic deviation is insufficient for assessing progression, since one patient may manifest a similarly-sized deviation much more readily than another. The purpose of this study was to prospectively test the feasibility of a new office-based scale of control for children with intermittent exotropia.

SUBJECTS AND METHODS

We prospectively evaluated all patients (n=30) with intermittent exotropia less than 14 years of age presenting to our institution from July 1, 2004, through June 30, 2005. Intermittent exotropia was defined in this study as an intermittent distance exodeviation of at least 10 prism diopters (PD) without an underlying or associated neurologic, paralytic, or ocular sensory disorder. The median age of the patients was 72 months (range, 15 months to 13 years) with a median distance exotropia of 20 (range, 10 to 40) prism diopters.

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Presented in part at the annual American Association for Pediatric Ophthalmology and Strabismus, Washington, DC, March 27-31, 2004

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The level of control was evaluated in each patient at both distance and near fixation using the scale described in the Table. The scale ranges from 0 (phoria, best control) to 5 (constant exotropia, worst control). Fixation targets were standardized: a TV screen at 3 meters for distance fixation and a Lang near viewing stick or similar accommodative target at 33 centimeters for near fixation. Control levels 5 to 3 were assigned while observing the patient for a 30-second interval before dissociation, and levels 2 to 0 were assigned if dissociation was required (Table).

RESULTS

The distance and near fixation control scores for each of the 30 study patients are shown in Figure 1. The level of control at distance fixation was worse than (17 [57%] patients) or the same as (13 [43%] patients) the level of control at near for all 30 patients. The level of control at distance fixation ranged from 0 to 5 with a median of 2 while the level of control at near fixation ranged from 0 to 4 with a median of 1. The distribution of the overall control scores (Figure 2) ranged from 0 to 8 with a median of 3, reflecting the wide spectrum of control in this disorder.

DISCUSSION

In this prospective study of children with intermittent exotropia, we found our scale useful in quantifying control of the exodeviation. The 30 children in this study displayed a wide spectrum of control (range, 0 to 8), with 0 signifying a phoria with no tropic component at either distance or near, even after dissociation, and 10 denoting a constant tropia at both distance and near fixation. As expected in patients with intermittent exotropia, the level of control at distance fixation was worse than or the same as the level of control at near in all 30 patients.

It is commonly believed that a worsening of control in intermittent exotropia is an indication for surgical intervention and that, without intervention, there will be further deterioration with loss of fusion and stereopsis. Various authors have suggested that the size, frequency, or duration of the tropia, as important factors in gauging progression. Nevertheless, precise criteria for progression have not been established. Questioning the family regarding the control of the deviation and the occurrence of monocular eye closure in bright light have also been suggested as signs of deterioration. However, these historical clues are dependent upon the observation and memory of non-professional observers.

More recently, some investigators have focused on assessing control in the evaluation of patients with intermittent exotropia.[3–6] Two studies have measured the level of control with a 3-point scale (good or excellent, moderate or fair, and poor);[3,4] however, these scales do not permit as fine a gradation of severity as our 10-point scale. Furthermore, the study by Stathacopoulos et al[3] failed to find a significant association between their 3-point scale and a Mentor B-VAT measure of distance stereoacuity. Petrunak and coauthors[5] have described an office-based system that grades time to refusion following dissociation, but their method is unable to assign a score to patients who are tropic during their examination. Haggerty and coauthors combine a parental report of home control (0 to 3) with office control (0 to 2 for both distance and near fixation), yielding a total score from 0 to 7 (the Newcastle or NIDEX Scale).[6] It is unclear, however, whether it is reasonable to numerically add a parental report score to a more objective office control score. Using their scale,[6] an error in parental observation could profoundly alter the overall score and subsequent management.

The scale described in this report is a clinically-based measure that can describe the wide range of control in patients with intermittent exotropia and avoids many of the weaknesses of prior systems. While not designed for specific surgical planning (such as the exact muscle or number

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of millimeters of surgery to perform), it provides a quantitative measure of the severity and duration of the manifest component of the exodeviation. We developed this scale as an easy-to-use, age-independent score that does not require the use of expensive or obscure equipment. However, we have not fully studied whether it is more useful to numerically add the distance and near control scores or evaluate them individually as separate measures. Further studies are also needed on the test-retest reliability of our scale in order to define what magnitude of change constitutes a true change in control. Applying this scale to the same patients throughout a single day and from one day to the next will further define the usefulness of this scale in clinical studies and as a criterion for medical and surgical intervention.

Our office-based scale can describe the wide range of control in patients with intermittent exotropia. Such a scale, ranging from phoria to constant tropia, may be useful in the longitudinal evaluation of patients with intermittent exotropia and as an outcome measure in randomized treatment trials.

Acknowledgments

Supported in part by grant EY15799 and EY11751 from the National Institutes of Health, Research to Prevent Blindness, Inc, New York, NY (JMH as RPB Olga Keith Weiss Scholar and an unrestricted grant to Mayo Clinic, Department of Ophthalmology), and Mayo Foundation.

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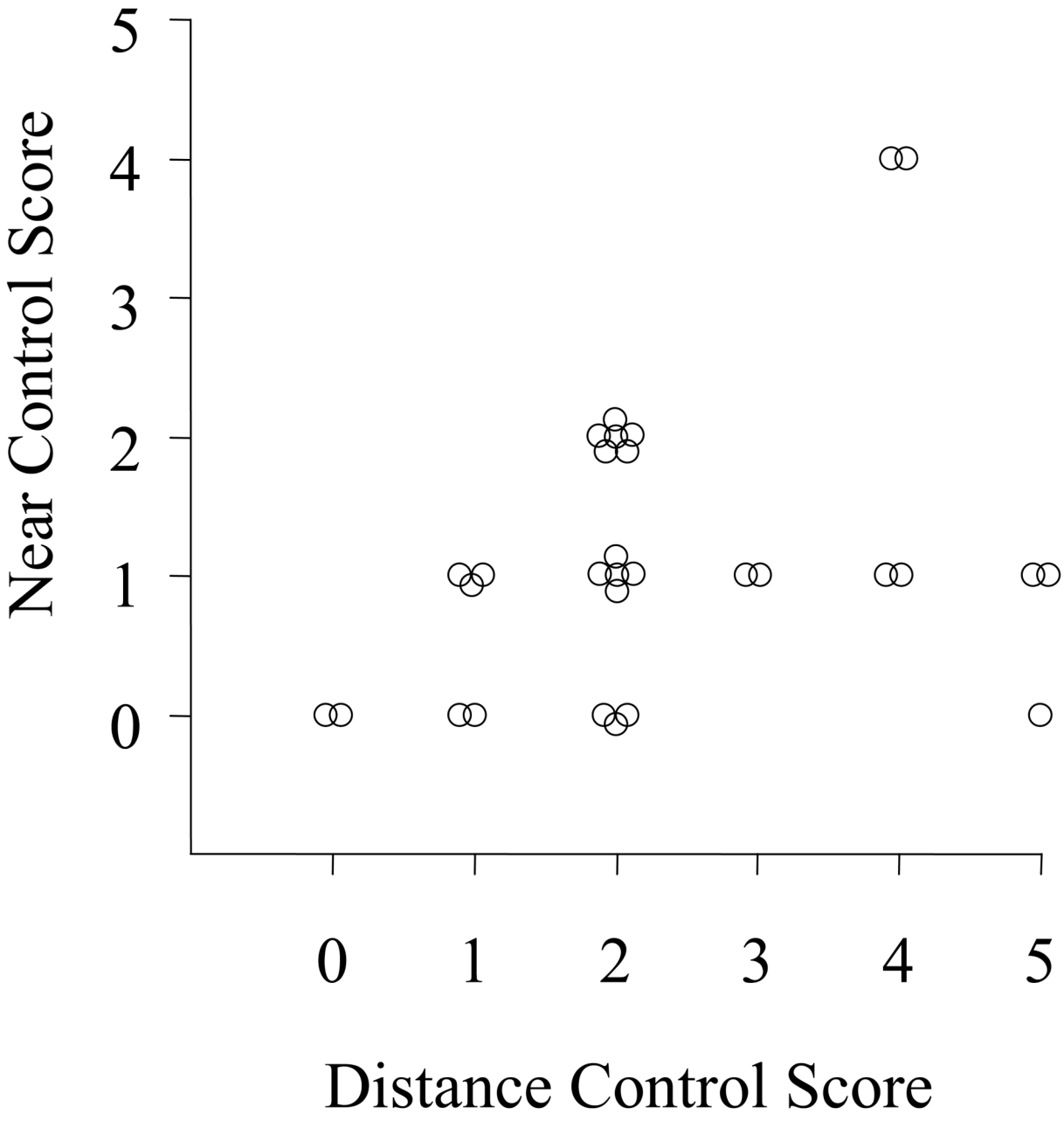

Figure 1.
Distance and near control scores for 30 children with intermittent exotropia (IXT). The whole range of scores is used and, as expected in children with IXT, the distance control is generally worse than the near control.

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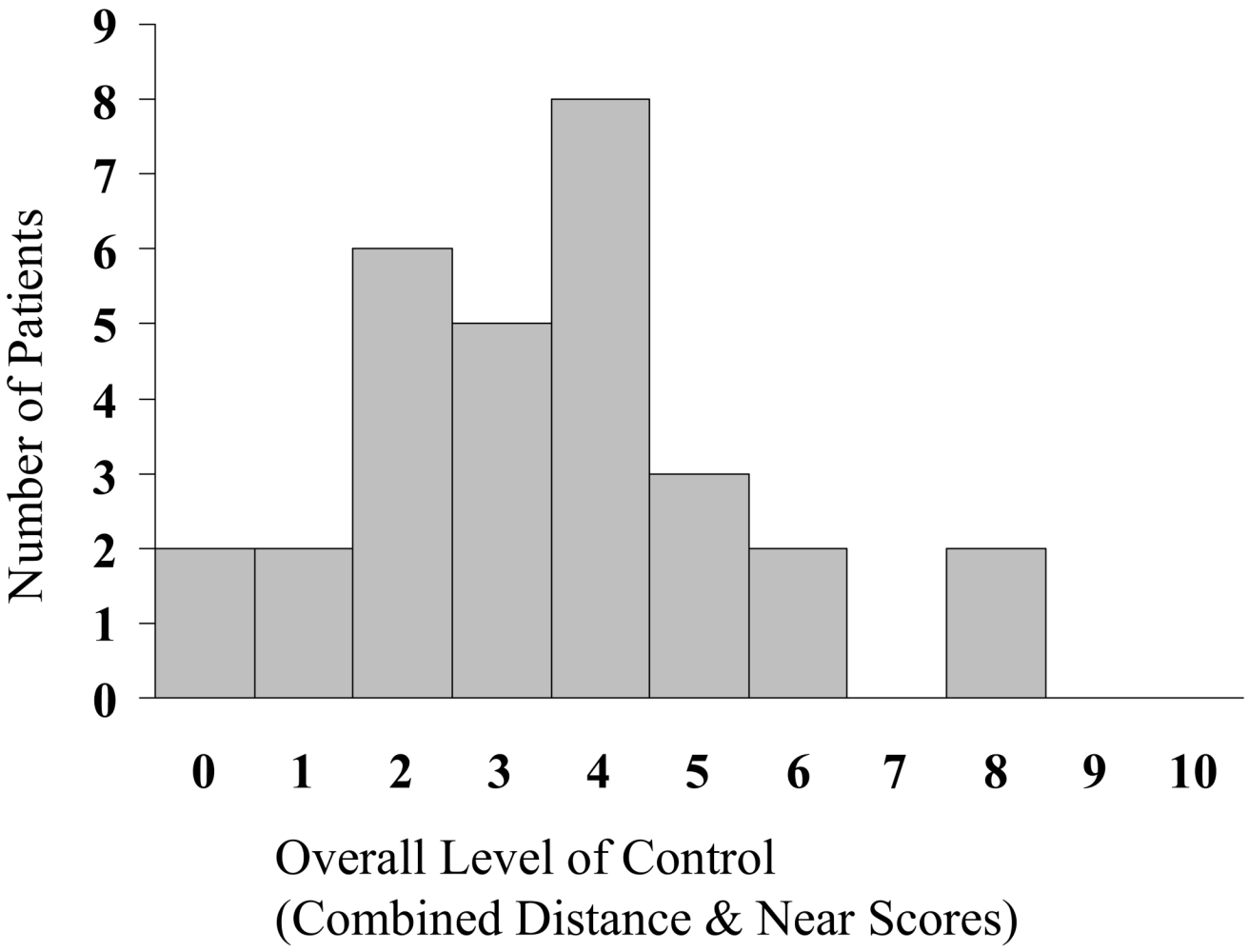

Figure 2.
Combined distance and near control scores for the 30 children. The distribution of the combined control scores covers a wide spectrum of the condition.

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Table 1

Intermittent Exotropia Control Scale

5 = Constant exotropia
4 = Exotropia > 50% of the exam before dissociation
3 = Exotropia < 50% of the exam before dissociation
2 = No exotropia unless dissociated, recovers in > 5 seconds
1 = No exotropia unless dissociated, recovers in 1–5 seconds
0 = No exotropia unless dissociated, recovers in < 1 second (phoria)

This scale is applied to each patient for both distance and near fixation which, when combined, yields an overall control score ranging from 0 to 10. Levels 5 to 3 are assessed during an initial 30-second period of observation. Levels 2 to 0 are graded as the worst of three rapidly successive trials. An occluder is placed over the *right* eye for 10 seconds and then removed, measuring the length of time it takes for fusion to become re-established. The *left* eye is then occluded for a 10-second period and the time to re-fusion is similarly measured. A third trial of 10-second occlusion is performed, covering the eye that required the longest time to re-fuse. The worse level of control observed following the 3, 10-second periods of occlusion should be recorded for that visit. If the patient has a micro-esotropia by simultaneous prism and cover test, but exodeviation by alternate cover test, the scale applies to the exodeviation.