

VISION THERAPY IN A YOUNG PEDIATRIC POPULATION



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Abstract

We conducted a retrospective chart review of pediatric patients under the age of 6 who had at least one vision therapy (VT) session. The VT was conducted in the Vision Therapy Service, the Preschool Vision Therapy Service or the Infant Vision Clinic of the State University of New York State College of Optometry from September 2001 to September 2004. The yield was 35 charts that met the criteria and were available for review. The average age of these patients was 4.4 years. Among the data recorded for each patient were: initial reason for exam, referral source, symptoms, ocular and medical histories, number of vision therapy sessions completed and reasons for cessation of therapy. Almost 60% of patients seen for evaluation and later for VT were diagnosed as strabismic. The average number of therapy visits per patient was 10.

Key Words

amblyopia, orthoptics, pediatrics, preschool, strabismus, vision therapy

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INTRODUCTION

There are a limited number of studies in the optometric literature regarding vision therapy (VT) for patients under the age of 6.¹⁻⁴ The majority of these are case reports.¹⁻³ To our knowledge, there have been no reports of the characteristics of these patients that could be used as a profile for planning purposes in either private or institutional VT clinical settings. The purpose of this study was to provide data regarding infant and pre-school patients who were treated in the Vision Therapy, or the Pre-School Therapy Unit (PST), or the Infant Vision Clinic of the State University of New York (SUNY) over a three year period.

BACKGROUND

Patients five and older are evaluated and treated in the VT clinic after referral from within SUNY or by a direct referral from an outside professional. In the former instance the record of the last comprehensive optometric evaluation is provided. When the patient is referred from a source external to SUNY, a copy of the individual's most recent eye examination must be received prior to the initial VT evaluation. After a review of that record, a VT staff optometrist decides whether a further comprehensive optometric evaluation, performed at SUNY, is required before the VT evaluation.

At the initial VT visit all patients receive evaluations that include: visual acuity, cover testing, external examination, ocular motor status, phorometric testing including distance and near phorias, vergence ranges and accommodative testing. Additional or supplemental testing can include ophthalmoscopy, refraction, cheirosopic tracing, vectogram ranges,

fixation testing, retinal correspondence testing, and more specialized ocular motility evaluations (e.g. DEM or Visagraph) if they were appropriate. When the evaluations indicated that VT was an appropriate intervention, the clinician discussed the particulars with the parent/caregiver of the patient. If it was agreed, a schedule was developed, according to the particular case, including the number of visits to be conducted on a weekly or other appropriate basis. This therapy was performed in a group setting generally with three patients receiving therapy at the same time. In virtually all instances, the patient was under the care of the same staff doctor or resident. In some instances these optometrists provided direct care, but in other instances these doctors supervised care given by interns.

The infant vision clinic examines patients under the age of 5 and is not the same as the pediatric clinic. If the comprehensive examination indicates the need for vision therapy, therapy is conducted in the PST clinic. Before initiating therapy a complete history including: ocular, medical, pre/peri/post natal, developmental and family history is conducted. This history is vital in the understanding of the development of binocularity, or lack of it. Binocular development is thought to closely parallel the history of the child from conception through birth and after.⁵

Unlike the primary VT clinic, where therapy sessions are scheduled for 45 minutes, in the PST, therapy sessions are scheduled for 30 minute sessions. Another difference between the two clinics is that the therapy is conducted one-on-one with the patient and doctor. If a patient is too immature for in-office PST, the therapy is scheduled primarily on a home basis, with

frequent follow ups conducted until he/she is mature enough for office PST. The case is the same with infant patients seen in the Infant Vision Clinic: therapy is accomplished on a home basis with frequent follow ups.

METHODS

We conducted a retrospective review of charts for patients under the age of 6 who had at least one therapy visit (CPT code 92065) in the VT, preschool or infant vision clinic at SUNY between September 2001 and 2004. There was no lower age limit, but the upper age limit was 5 years 11 months. For those charts that met the criteria, we recorded: patient ages, reason for exam, referral sources, entering symptoms, ocular and medical histories, visual diagnoses, the number of therapy sessions and the reasons for cessation of therapy.

RESULTS

Subjects

Thirty-five charts met the study criteria. All charts were available for review. The average patient age was 4.4 years (range 5 months to 5 years 11 months). Fifty one percent (18 patients) were male, 49% (17 patients) were female.

Referral Sources

Ten patients (28.6%) were referred from outside of SUNY. Of these, 5 (14.29%) patients were referred from occupational therapists, four (11.43%) patients were referred by outside optometrists and one patient (2.86%) self-referred specifically for VT. The remaining 25 patients were referred for VT after having a comprehensive eye examination within the Infant Vision or Pediatric Clinic at SUNY.

Entering Symptoms

These were determined by a review of the following: a history form completed by the parent/caregiver of the patients who received a comprehensive examination at SUNY, clinic correspondence and examination notes for patients referred by outside providers, and/or symptoms reported during the initial VT evaluation. The most common sign/symptom reported was an eye turn (60%). Tracking problems (11.42%), visual perceptual/motor problems, distance vision blur and binocular problems were each reported in 5.7% of patients. A complaint of blurry vision and reading too close were each reported by one patient (2.86%). Two patients (5.7%) reported no symptoms. (Figure 1)

Ocular History

Four patients, (11%), reported prior strabismus surgery. More specific information as to the type of surgery that was performed was not available. Two patients, (5.7%), reported a history of retinopathy of prematurity (ROP).

Medical History

Two patients (5.7%) were hospitalized in a neonatal intensive care unit. These patients were distinct from the two whose history included ROP. Another patient did report a history of prematurity without a history of ROP. Two patients, (5.7%), were diagnosed as developmentally delayed. One patient was diagnosed with craniosynostosis.

Visual Diagnoses

The visual diagnoses were determined by ICD-9 codes recorded in the examination record. Most patients had multiple diagnostic codes. We used the first three listed codes although we did not differentiate by primary, secondary or tertiary diagnosis. The most frequently diagnosed condition was an oculomotor dysfunction, reported in 20% of patients. This diagnosis was followed by constant monocular esotropia, in 14.29% of patients and intermittent alternating exotropia in 11.43% of patients. Refractive amblyopia and alternating esotropia were each reported in 8.57% of the sample. Almost six percent of patients were diagnosed with one of the following: accommodative esotropia, intermittent esotropia and constant alternating exotropia. (Figure 2) The following diagnoses were each reported in only one patient: accommodative spasm, strabismic amblyopia, unspecified esotropia, convergence excess and binocular vision disorder unspecified. In looking at the diagnoses by category, 20 patients, (57.14%), were diagnosed as strabismic.

Number of Therapy Sessions

The average number of therapy visits per patient was 10 (range 1-36). The patient who had 36 visits was the patient with the craniosynostosis.

Reasons for Cessation of Therapy

Upon ceasing VT, the staff noted the reason for stopping. Seventeen patients (49%) did not report a reason for the cessation

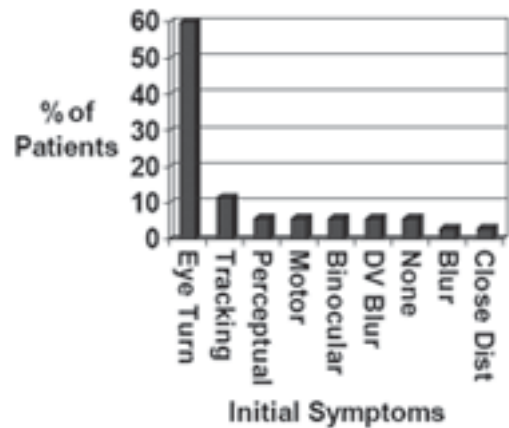


Figure 1.

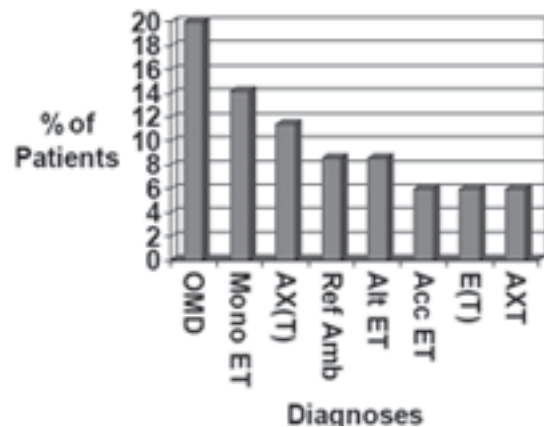


Figure 2.

of VT. Nine patients (26%) successfully completed the program, as deemed by the attending staff. Three patients, or slightly over 8%, were referred for surgery. It is possible in these cases that therapy was resumed after surgery was completed, but any future therapy occurred outside the time frame of the study. Two patients (6%) were dismissed for behavioral issues. One patient in each category was dismissed because of insurance issues, scheduling conflicts, vacation or self-dismissal.

DISCUSSION

Gruning notes that most practitioners do not "think of" VT for young patients, he presents six arguments why practitioners should incorporate it into a VT practice.⁶ These reasons include: it is challenging, outcomes are generally very good, early intervention may be easier and less costly, early application of lenses, prisms or occlusion can be successful, the therapy can be performed by a therapist and that these services will be filled by other professionals if not done by optometry. He also notes that the conditions most commonly treated include strabismus, amblyopia, oculomotor and/or visuomotor dysfunction.⁶ Early guidance for amblyopic/strabismic patients can be an important and

valuable component of the total therapeutic regimen.⁵

Unfortunately, studies on the efficacy of VT for this population are lacking. A literature search did not reveal prior studies dealing with the efficacy of VT in young children. There are, however, case reports on this topic.¹⁻³ To our knowledge this report is the first to specifically look at preschool VT. A prior retrospective study by Krumholtz and FitzGerald on outcomes in strabismic patients treated with VT found a success rate of 36% in patients ages 2 to 6.⁴ The authors defined success as a reduction in the magnitude of the strabismus to 8 prism diopters or less. When looking at specific classifications of strabismus in the 2 to 6 age group, they found a success rate of 100% for intermittent exotropia patients (N=2), 50% for patients with accommodative intermittent esotropia (N=2), and 43% for patients with constant accommodative esotropia (N=7). It is important to note that this study looked at outcomes for all pediatric patients with strabismus and was not specific for preschool children.

While our study did not specifically look at outcomes of success based on diagnosis, sixty percent of the patients in this study initially presented with a complaint of an eye turn. This percentage corresponds well with the primary diagnosis of strabismus in 57%, or 14 patients who underwent preschool VT.

Case reports discussing the optometric treatment of esotropia in preschool children can be found in the optometric literature.¹⁻³ Maples and Bither report on the successful treatment of an infantile esotrope treated with corrective lenses, patching, bi-nasal occlusion and 14 weeks of VT.³ After treatment, the patient had a visual acuity of 20/20 in each eye without a strabismus. Similarly, FitzGerald and Gruning report on the treatment of a 3 year 3 month old male with accommodative esotropia and bilateral amblyopia treated with lenses and occlusion and later with 10 sessions of preschool VT.¹ After the completion of therapy, the patient had 20/20 vision in each eye and no strabismus. Yang et al reported on the treatment of esotropia and amblyopia in a 2 year old child using lenses, occlusion and surgery.² After surgery, the patient had a consecutive exotropia and amblyopia that was treated with in-office VT. After treatment, the visual acuity was 20/25 in each eye and the patient was orthophoric in all positions of gaze.

Strabismus and amblyopia are problems that are found in patients of any age and are often treated more aggressively in younger children than older children. Determining the prevalence of amblyopia in infants, toddlers and preschool children presents special difficulties because of the uncertainty in establishing precise visual acuity measurements in many children of this age group.⁷ Prior studies have found a prevalence of 2-3% for amblyopia and 3-4% for strabismus in preschool children.⁸ In the current clinical study, almost 60% of patients had a diagnosis of strabismus, and 8.75% had a diagnosis of amblyopia. Certainly the higher percentages of patients with strabismus and amblyopia reflect the fact that patients were seen in a VT clinic, and not as a random sample. Therefore, this sample cannot be compared to prevalence factors of the general population. The fact that many patients with strabismus were not amblyopic can be attributed to the percentage of patients who were diagnosed with intermittent or alternating strabismus. In this study 11 patients, or 31% of the strabismic patients, had alternating, intermittent, or intermittent alternating strabismus.

In the past few years, much has been written about the treatment of amblyopia, specifically with the Amblyopia Treatment Studies.⁹⁻¹² Although these studies did include patients as young as age 3, they dealt with patching or topical atropine as treatment options. These studies compared the efficacy of patching versus atropine, the frequency of patching regimens and the frequency of atropine instillation. They did not use traditional active in-clinic VT as was used in this study.

In this study, the average number of VT sessions was 10. This is similar to the average number of VT sessions reported in studies on adult patients.^{13,14}

Thus, the present study adds evidence to the previously discussed case reports that young children with binocular problems, especially strabismus, can be enrolled and can benefit in an in-clinic VT program, based upon the clinical opinions of the attending staff.

CONCLUSION

The present study about young pediatric VT patients is unique in that it presents data that are not previously reported. Our study can serve as a template for future investigations of the characteristics of pediatric VT patients. However, the inability to obtain data in some cases on the

total sample is because this study was retrospective. Additionally, the sample size of patients was small, with only 35 patients. Future studies should be prospective so that more complete data can be obtained and improvement in alignment or visual acuity can be documented.

Acknowledgement

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