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Low Vision Assessment: Complications from Juvenile Rheumatoid Arthritis

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Abstract

Background: Juvenile Rheumatoid Arthritis (JRA) is an inflammatory disease that affects the joints of children and is associated with ocular complications, like uveitis and cataract. Patients with such complications can benefit from a low vision assessment to improve their functionality and their quality of life. In this case study, the importance of early detection and management of ocular complications of JRA, as well as visual rehabilitation through a low vision assessment, are highlighted and discussed. **Case Presentation:** A 12-year-old female of East Indian descent presented to the Low Vision Center of the University of the West Indies Optometry Eye Unit, bilaterally aphakic (absence of crystalline lens) as a result of complications she developed secondary to a systemic condition diagnosed as JRA. She presented with a distance visual acuity of 2.30 logMAR in the RE, and 1.64 logMAR in the LE, at near she was able to read 8.0 M and 3.2 M at a distance of 8 cm for RE & LE respectively. She has a history of ocular disorder secondary to JRA such as cataract, uveitis, upon low vision assessment a new spectacle prescription and an illuminated stand magnifier of 8D was issued, the patient was satisfied with the outcome of the treatment, management and low vision device issued. **Conclusion:** At the end of the low vision assessment, the patient was extremely satisfied and looked forward to the prospect of returning to school. Although JRA can have severe ocular complications, with the correct management, a patient's quality of life can be dramatically improved thus stressing the importance of these types of visual assessments.

Keywords

Juvenile Rheumatoid Arthritis, Low Vision Assessment, Cataract, Aphakia, Stand Magnifier

1. Introduction

JRA is a common rheumatic disease that affects children before the age of 16 and becomes symptomatic for at least 6 weeks [1]. Those with JRA may experience swelling, pain and possible loss of function of any joint, particularly the large joints. Manifestations of JRA also include high fever, skin rash, iritis and uveitis. Studies have been done to determine the exact cause of JRA, but it is not quite clear; however, it has been found that this disorder is due to uncontrolled activation of the innate immune system [1]. The association between rheumatologic and ocular inflammatory disease (OID) is well recognized. Uveitis occurs in 10% up to 45% of the patients, depending on the specific subtype of JIA [2]. Other common complications include band keratopathy, posterior synechiae, cataract, secondary glaucoma and cystoid macular oedema (CME) [3]. These complications may be caused by the disease or by medications the child takes for the disease. The treatment of JRA is aimed at reducing the inflammation present while maintaining full range of movement of the joints affected, relieving the pain and identifying and treating any complications that arise [4]. A recent review of the literature indicated that uveitis is seen more in females than males and up to one-third of all children with uveitis ended with severe visual impairment and low vision [5]. This low vision assessment aimed to maximize the residual vision of Miss P, so that she may be able to function independently at school, to report and discuss the findings and ocular implications of JRA.

2. Case Report

Miss P, a 12-year-old female of East Indian descent was referred from a general hospital in Trinidad to the University of the West Indies (UWI) Optometry Clinic for a low vision assessment, she was diagnosed with JRA about two and a half years ago and on a wide range of medications including Azopt, Combigan, Folic acid, Humira, Methotrexate, Muro, Prednisolone, and Predforte. Her mother reported cataract extractions, which was performed some few years ago on both eyes, IOL implanted during this period lead to complications of uveitis, which resulted to their removal. The patient is at present bilaterally aphakic, the patient has been experiencing overall blur at both distance and near, but reported that her vision decreased significantly over the past three months. She feels that the left eye is better for both distance and near vision. She had no previous history of similar visual loss among her family members; her presenting visual acuity was 2.30 logMAR Right Eye (RE) and 1.64 logMAR Left Eye (LE) at distance, 8.0 M (RE) and 3.2 M (LE) for near at 8 cm. On Slit Lamp Examination (SLE), observing the anterior segment the cornea for both eyes appears hazy with the RE developing neovascularization, and absence of crystalline lens in both eyes. The patient's goal is to read textbook print between 1.5 M to 1.00 M.

2.1. Clinical Assessment

Clinical assessment revealed that the patient has an acute rise in the Intraocular

pressure (IOP). The patient reported not using her anti-glaucoma drops for four days prior to her visit to the low vision center, which could explain the reason for the dramatic rise in the IOP of about 50 mmHg both eyes. Anti-glaucoma drops were immediately administered, to reduce IOP as quickly as possible to prevent any optic nerve damage. The patient was given an urgent referral letter to return to her local eye clinic to manage the elevated IOP, It was determined that once the eye pressure stabilizes that the patient would return to resume the assessment. The patient visited her local eye clinic, returned back to the UWI Optometry Clinic three (3) days later and IOPs reduced to 10 mmHg and 18 mmHg in the RE and LE respectively.

2.2. Low Vision Assessment

Miss P was accompanied by her mother during the examination, both have a good understanding of JRA and how it affects the eyes. She had no previous history of low vision examination, she reported no physical limitations or memory problems. It was observed that the patient was able to move around the clinic in areas of good lighting but needed assistance from her mother when moving around in dim lighting. She had a problem with distance and near task regarding difficulties with reading her textbooks. She had no difficulties in writing and was able to write in a straight line. On vision at distance, she had difficulties in seeing the blackboard, recognizing faces, watching television, etc. She prefers her LE over her RE, has no colour perception problem. She was comfortable with performing daily living skills such as self-help skills, home management, food identification, etc. Her objective retinoscopy result was +13.50 D and +9.25 D for both RE and LE respectively, with significant improvement in distance visual acuity in both eyes with a corresponding visual acuity of 1.20 logMAR (RE) and 0.80 logMAR (LE), upon subjective refraction she accepted +14.00 D (RE) and +11.00 D (LE) with a ADD +2.00 D, visual acuity further improved to 1.00 logMAR (RE) and 0.64 logMAR (LE). The dioptric power of the low vision devices was calculated and predicted [6]. The handheld and stand magnifier was considered based on the goal of the assessment, however, she was prescribed an 8D illuminated stand magnifier suitable for her near task for reading and it gives wider field of view. Stand magnifiers was preferred and prescribed because it will prevent any joint pains in the wrist or hands, which may occur if she were to use the hand magnifier for a long period. She was comfortable reading with it and her near acuity was improved to 1.6 M at 10 cm along with her spectacle prescription. No distance device was tried since it was more important for the patient to read and focus at near, however the spectacle prescription improved distance vision remarkably. The goal of the patient to read prints equivalent to 1.5 M was meet, she was instructed on the adaptation period necessary, including the strict use of the spectacle correction when doing schoolwork or near tasks only.

2.3. Rehabilitation Plan

1) Spectacle correction without telescope;

2) 8D illuminated stand magnifier for near visual task;

3) Table lamp with Light-emitting diodes (LED) direct light for near evaluation;

4) The patient was asked for follow up in the next three month for a low vision evaluation.

2.4. Post Low Vision Assessment

Patient was asked to visit the clinic after three months of prescribing low vision aid for functional vision assessment. She was found to be very comfortable with the vision aids and reported to have returned to school able to function independently. She was therefore strongly advised to maintain her visits at her local eye clinic and to have annual eye exams at the UWI Optometry Clinic to ensure that her spectacle prescription remains stable.

3. Discussion

The World Health Organization(WHO) defined low vision as best-corrected visual acuity of less than 20/60 and equal to or better than 20/400 in the better-seeing eye, or no more than 10˚ of central vision which cannot be fully corrected with medical treatment, surgery or refractive correction (WHO, 2001). The term low vision specifically implies a reduction in visual function and not strictly based on the reduction in visual acuity only.

The JRA is a form of arthritis that mostly affect children, it can cause complications in various part of the body including the eye, some of these complications are uveitis, cataract, glaucoma and they may be caused by the disease itself or the medications administered during the management of JRA. The patient of this case study suffers from systemic JRA. Her late diagnosis of JRA could be the reason that she had ocular complications of uveitis and cataract secondary to medication. It was observed that early detection and treatment of JRA would alleviate the complications and improve vision and quality of life [7]. JRA patients with controlled uveitis that is being treated with topical glucocorticoids should be monitored at least once a month until the medication can be tapered off. If no resolution occurs, patients should be put on systemic immunosuppressive therapy [8]. We can speculate the timeline of events that occurred in the life of this patient until the present. She would have had episodes of uveitis at a young age, causing the development of a cataract in the left eye at four years of age uveitis is usually asymptomatic and insidious, and the effects of the uveitis would only be noticed when vision has been affected [9] [10].

The patient did not have any spectacle correction at that time of her visit and relied on her right eye for functional vision. The aphakic eye with no spectacle prescription would most likely develop amblyopia, and eventually strabismus [11] [12]. The option available in mitigating against amblyopia is an early optical correction of aphakia in children such as the use of aphakic spectacles, contact lenses and IOL implantation. Aphakic patients with JRA would be suitable for aphakic glasses and contact lenses, as IOL implantation is risky as this can lead to further complication [13].

When a child develops cataracts at a young age, it must be removed immediately because it hinders the advancement of vision. Spectacles or a contact lens must be fit quickly so that the visual pathway to the brain can continue to develop. The ocular complications of JRA are severe, but through a low vision assessment, functional vision can be maximized and managed for children with visual impairment [14].

4. Conclusion

The exact cause of JRA is unknown but the complications and the severe visual impairment caused can affect a child's normal development. Low vision aids could be very beneficial to children with severe vision impairment. However, care and diligence are required to assess the suitability and usefulness of these low vision devices. Miss P is now able to perform her daily activities independently because of low vision aid. It is therefore recommended to do low vision assessment in children with severe visual impairment so as to determine their suitability for the use of low vision device which will go a long way to improving their quality of life.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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