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Visual Outcomes Prognosticators in Juvenile Idiopathic Arthritis-Associated Uveitis

Arash Maleki, MD; C. Stephen Foster, MD, FACS, FACR

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Childhood uveitis accounts for 5–10% of all types of uveitis. The estimated incidence of childhood uveitis is 4.3 per 100,000 with a prevalence of 27.9 per 100,000. In 13 studies of pediatric rheumatic diseases, the most common cause of uveitis in 11 was Juvenile idiopathic arthritis (JIA). The most common diseases in the other two studies were Behçet’s disease and systemic lupus erythematosus (SLE). JIA-associated uveitis continues to blind 12% of these patients. Given that 60,000 to 100,000 children in the United States have JIA-associated uveitis, a 12% prevalence of blindness in those with uveitis represents a substantial burden. Despite advances in the diagnosis and treatment of JIA-associated uveitis, a substantial number of patients with this condition still become legally blind.

In a research study, we analyzed the records of our patients with JIA-associated uveitis. Sixty-five patients were identified. Forty-three of these patients with a minimum follow-up period of six months after presentation were included in the study. Forty-seven parameters were analyzed to determine the relative odds of visual rehabilitation among patients with each characteristic. Statistical methods included bivariate and multivariate statistical models.

All of these patients had been treated according to our stepladder protocol for uveitis, with rapid escalation to an oral nonsteroidal anti-inflammatory drug in cases of recurrent inflammation during steroid tapering, aiming for steroid-free remission. In patients with inadequate response to this treatment, immunomodulatory therapy (IMT) had been initiated.

Visual acuity values were converted to a logarithmic scale for data analysis. Visual acuity improvement was defined as a gain of at least one Snellen line from the initial visit to the last follow-up. Two dichotomous visual outcome variables were analyzed: improvement versus no improvement, and visual acuity $\geq 20/40$ versus $< 20/40$. Bivariate analysis of variables potentially

associated with visual outcome consisted of either chi-square or the Fisher's exact test for discrete variables, and nonparametric one-way analysis of variance (Kruskal-Wallis) test for continuous variables. Multivariate analysis of the association of factors with each visual outcome was performed separately using generalized estimating equation logistic regression models; these models allow use of data from both eyes of a patient while accounting for the correlation between fellow eyes. In addition, a linear regression analysis using generalized estimating equations was conducted for the final visual acuity to determine the presence of a correlation between the final acuity and other variables under study. Selection of variables for the multivariate model was based on a P value <0.10 in bivariate analysis or prior identification as clinically important from the literature and the authors' clinical judgment. To arrive at the most parsimonious model, the factor with the highest associated P value was eliminated until only those factors with associated P values less than 0.05 remained.

Thirty-seven (86%) of the patients were female, with a mean age of 13 years at the time of uveitis diagnosis. Ninety-three percent of patients had chronic iridocyclitis, and 5% had recurrent inflammation. The mean overall duration of uveitis was 146 months, with females suffering from a significantly longer duration of uveitis than did males ($P < 0.001$). Seventy percent of the patients experienced visual improvement with their therapy. When controlling for potential confounders, male sex, shorter duration of uveitis, older age at disease onset, and a shorter delay in presentation to a uveitis specialist were associated significantly with visual acuity improvement. Visual acuity at presentation, older age at disease onset, absence of glaucomatous neuropathy, male sex, and use of systemic nonsteroidal anti-inflammatory/IMT were correlated strongly with a final visual acuity outcome of 20/40 or better.

In conclusion, JIA-associated uveitis is a serious ocular condition with a guarded visual prognosis when treatment is inappropriate or insufficient. Increased awareness of its prognostic factors will facilitate prompt referral and treatment, offering the best chance of minimizing visual impairment in patients with JIA.

For more information, see the following references.

References

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