Attempts to Reduce the Progression of Myopia and Spectacle Prescriptions during Childhood: A Survey of Eye Specialists

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Purpose: To determine methods tried in clinical trials to reduce the progression of myopia in children, and spectacle prescribing patterns of hospital ophthalmologists.

Methods: A multi-sectioned survey composed of Likert items relating to the methods of reducing myopia progression (orthokeratology lenses [O-K lenses], undercorrected glasses, and topical atropine) and the patterns of prescribing spectacles for children (including two cases involving a 5-year-old girl and an 8-year-old boy) were distributed to members of the Korean Ophthalmological Society, and the collected data was statistically analyzed.

Results: A total of 78 out of 130 ophthalmologists returned the survey. On a scale of 1 to 5, the mean rates of whether the ophthalmologists think O-K lenses arrest myopia progression, and whether they recommend their patients to wear O-K lenses if indicative, were 3.06 and 2.75, respectively. Moreover, the mean rates of whether they consider that wearing glasses which are undercorrected would slow down the progression of the myopia, or if they think topical atropine helps in arresting myopia progression in children, were 2.34 and 1.27, respectively. In response to the case studies, the majority of practitioners preferred to prescribe the full amount found in cycloplegic refraction to pediatric patients with myopia.

Conclusions: Ophthalmologists in clinical practice encouraged children to wear O-K lenses more than undercorrected glasses as a way to retard myopia progression. However, the application of atropine is rarely tried in clinical trials. In managing pediatric patients with myopia (case specific), the majority of the practitioners chose to prescribe glasses with full cycloplegic correction.

Key Words: Atropine, Eyeglasses, Myopia, Orthokeratology lenses

Myopia, known to be the most common refractive error and childhood ocular disease in Asia, is a physiological process that the eye uses to adapt to the excessive near focal surroundings, which is easily correctable with optical devices [1]. Yet, the health risk associated with myopia should not be underestimated since the economic impact of routine optometry visits, contact lenses, spectacles, and refractive surgeries on the myopic population is considerable [1,2].

The onset age of myopia that is frequently mentioned is between 5 and 15 years, and a number of studies have been conducted to depict the prevalence rate of myopia worldwide. The etiology, pathogenesis, and treatment of myopia have also been debated over a long period of time in ophthalmic countries [3,4]. Studies and statistics for myopia by country have shown that both the incidence and progression rates of myopia are high in Asian children [3,4]. There had been epidemiological evidence that children who spend more time outside are protected from the development of myopia than those who spend more time doing near-work [5]. Moreover, methodological means to correct myopic refractive errors such as orthokeratology and the use of atropine have been reviewed intensively in East Asia [6-10]. In this study, a survey of Korean Ophthalmological Society members was conducted in order to evaluate the opinions of practitioners about some of the treatment modalities used to reduce myopia progression in children, as well as spectacle prescribing patterns for preschool children with myopia (2 cases).
Materials and Methods

A questionnaire was distributed to the members of the Korean Ophthalmological Society working in hospitals or private clinics in South Korea. Questionnaires completed by the respondents were collected at the 2009 Annual Symposium. The questionnaire was composed of two sections (one with multiple questions and another with two case specific questions). In the first section, respondents were asked to rate according to the Likert scale (from 1 to 5) on three statements about whether they think orthokeratology lenses (O-K lenses), undercorrected glasses, or the use of topical atropine reduces myopia progression in children (statement 1, 3, and 4), in addition to one statement about whether they would recommend O-K lenses to their pediatric patients with myopia (statement 2). On a scale from 1 to 5, a response of 5 was considered as ‘strongly agree with the statement,’ and 1 was considered as ‘strongly disagree with the statement.’ In the second section, the respondents were asked about the patterns of prescribing glasses to their hypothetical pediatric patients; there were 2 case specific questions relating to a 5-year-old girl and an 8-year-old boy with detailed information including the child’s age, distance vision, distance cover test (DCT) and near cover test (NCT), manifest refraction, and cycloplegic refraction (case 1 and case 2, Fig. 1). Respondents were asked to indicate whether spectacles should be prescribed, and whether this would be a full or partial correction. The collected data was statistically analyzed.

Results

Seventy-eight ophthalmologists responded (56%) out of 130 who had consented to fill out the questionnaire. Responses to the four Likert scale items were analyzed. The majority of ophthalmologists practicing in Korea were neutral about the idea of the effects that O-K lenses have on reducing myopia progression. 16.7% (13 / 78) of the respondents strongly disagreed with statement 1, and did not recommend that their pediatric patients with myopia wear O-K lenses if indicative. Only 6.4% (5 / 78) strongly agreed with statement 1, and the majority of the physicians chose to be neutral-to-negative about prescribing O-K lenses to children with myopia (Fig. 2). The mean rates in which the ophthalmologists thought that O-K lenses arrest myopia progression, and whether they would recommend that their patients wear O-K lenses if indicative, were 3.06 and 2.75, respectively.

Of the respondents, 32% (25 / 78) strongly disagreed that optical undercorrection slows down the progression of myopia (statement 3), and the majority of ophthalmologists were negative about children with myopia wearing glasses that are undercorrected as a way to reduce myopia progression (Fig. 2).

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Case 1
Age/gender: 5 yr/girl
Chief complain: for spectacle prescription
Uncorrected visual acuity
OD 0.2, OS 0.15
Manifestation refraction
OD -1.50 sph, -0.50 cyl 180 axis
OS -2.00 sph, -0.75 cyl, 180 axis
Cycloplegic refraction
OD -1.50 sph, -0.50 cyl 180 axis
OS -2.00 sph, -0.50 cyl, 180 axis
Alternate cover test
Orthotropia at near & far

Case 2
Age/gender: 8 yr/boy
Chief complain: recent progressive visual loss
Corrected visual acuity (with old glasses)
OD 0.5 (-4.00 sph -0.50 cyl 180 axis)
OS 0.4 (-4.75 sph -0.50 cyl 180 axis)
Manifestation refraction
OD -5.50 sph, -0.50 cyl, 180 axis
OS -6.00 sph, -0.75 cyl, 180 axis
Cycloplegic refraction
OD -5.00 sph, -0.50 cyl, 180 axis
OS -5.50 sph, -0.75 cyl, 180 axis
Alternate cover test
6Δ exophoria at near, orthotropia at far

Fig. 1. Detailed description of case 1 and 2 and the answers for preferred spectacle prescription of case 1 and 2. OD = right eye; OS = left eye; CR = cycloplegic refraction; PCR = post-cycloplegic refraction; MR = manifestation refraction.