

PREDICTIVE FACTORS OF MYOPIA PROGRESSION

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It is believed that predicting the future development of myopia can help identify high-risk children for early targeted intervention to delay the onset of myopia or slow progression. Researchers have built and evaluated different short-sightedness prediction models based on different data sets, including output refraction or biometric data, lifestyle data, genetic features, and data integration.

Scientists are studying the ways in which the eye grows, how to modulate eye growth, whether there can be a pharmaceutical to control eye growth. Genetic, environmental and etiological factors that accompany the development of myopia in children 6– 10 years and in adults are also studied. (Karla Zadnik, Donald O. Mutti, et al., 1999) Now it is suggested that at or before age 6 starting first grade: cycloplegic refraction $\leq +0.75$ D – risk for subsequent myopia.

Myopia risk is significant if: $\leq +0.50$ D for ages 7 to 8; $\leq +0.25$ D for ages 9 to 10.

Whatever age the child comes for a screening we may get help from growth curves - charts that are available on the internet that depict normal range of refraction for that specific age, we can use myopia risk calculators. Known factors that influence growing of myopia are as follows: age, Genetics and ethnicity, educational activities and visual environment, time spent outdoors.

It is noted that little outdoor play, continuous hours of near-work (>45 minutes), working distance <30 cm are crucial in myopia development. Increasing outdoor time by 1 hr per week decreases the risk of myopia progression by 2%/

A large number of studies of the prognosis of myopia development concerns the assessment of optical factors and the anterior-posterior value of the axis of the eye. In the work of a professor Rykova SO., (2000) established correlation between the optical components of the eye and the volume of accommodation. Differences were found between myopic and hypermetropic eyes. Other authors (K. Zadnik & al) used the values of cycloplegic refraction error and three optical components of the eye in the prognosis of the beginning of juvenile myopia at least 1 year after baseline.

The prognostic value of the ratio is also established axial length / corneal radius

(Sensitivity, 68.9%; specificity, 65.8%). If Ratio is $\geq 3,02$, then progression is in 174 cases from 205, if ratio is <3,02 then 335 cases from 349 have progression. It was installed, that the most sensitive morphometrical OCT test for the progressive form of myopia is the thickness of the retina in the area of 3 mm - 77.3% (DI 66.2 -86.2%). The highest specificity of the method was found in the study of refraction rates -

93.75% (DI 79.2-99.1%) and the length of the eye axis 94.12% (DI 80.3-99.1%). Thus, it can be considered with a fairly high reliability that the progressive form of myopia will be observed in children with a retinal thickness (in the area of 3 mm) more than 246.3 μm , with refraction more than 4.5 dptr and anterior-posterior eye size larger 25.3 mm. It is established that the presence of deformation of the layer of pigment epithelium exceeding 40% the studied area, typical for progressive myopia. (Boychuk I.M., Gorbatyuk T.L.)

The research of our laboratory within the framework of the science research work in 1984-1986 children of school age No. 35 of Odessa established that depth vision for a long distance was worse than a year before visual acuity decreased.

So, the visual acuity was 1.0, and the depth vision threshold for long distance was much higher than the norm and was 50 mm compared to the norm of 27.8 mm, $p=0.002$. The connection between the pathology of the connective tissue of the whole body and the progression of myopia was noted by V.P. Filatov and further confirmed by the results of experimental, electron-microscopic, biochemical, immunological, and clinical studies by other authors.

(Филатов В.П., Скородинская В.В., 1953; Збандут Е.В.; Усов Н.И. 1978; Аветисов Э.С., Йомдина Е.Н., Винецкая М.И., Тарута Е.П., 1981- 2005;

Ферфильфайн И.Л. 1975-2005; Бушуева Н.Н., 1995-2005; Curtin B., 1990; Thompson F.B., 1996; Goldschmidt E.C.; Fledelius H.C., 1995, Cibulskaya T.Y.)

All these parameters can be used in the practical work of an ophthalmologist; pay attention to such children of the group of risk in further observation and in refinement of treatment.