

# EFFICIENCY OF ORTHOKERATOLOGY IN THE TREATMENT OF ACCOMMODATION DISORDERS IN PATIENTS WITH UNCOMPLICATED ACQUIRED MYOPIA

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**Abstract:** The study included 80 patients (160 eyes) aged 7 to 19 years (mean  $15,2 \pm 4,2$  years) with low and medium myopia. All eyes were randomly divided into 2 groups of 80 each depending on the treatment, which in turn were divided depending on the degree of myopia and age. Patients of the main group applied orthokeratology (Moon Lens), the control group - optical correction. The study demonstrated the obvious superiority of the effect of orthokeratology on subjective indices of accommodation compared to optical correction.

**Introduction:** Myopia is labeled as one of the most common eye disorders, with a high incidence and prevalence worldwide. According to forecasts, in the near future (until 2020) there will be a considerable increase up to 2.5 billion of nearsighted people. Currently, according to the literature, one of the most effective methods of treatment and stopping the progression of myopia is orthokeratological treatment.

**Aim:** To evaluate the effectiveness of the orthokeratological treatment of accommodation disorders in patients with uncomplicated myopia acquired.

**Material and methods:** The study included 80 patients (160 eyes) aged 7 to 19 years (mean  $15,2 \pm 4,2$  years), of whom 50% were 7 to 16 years of age (average  $12,4 \pm 2,3$  years), and 50% - between 17 and 19 years (average  $18,2 \pm 0,5$  years). All clinical cases were divided into two groups of 80 eyes depending on the treatment applied: patients who underwent orthokeratological treatment (with Moon Lens night lenses) and patients who applied monofocal aerial optical correction. Clinical cases were evaluated before treatment, after 1 year, 2 years and 3 years. In turn, each group was randomized according to the degree of myopia, age.

**Results:** In the group with low-grade myopia and the age of 7-16 years, the orthokeratological treatment determined the increase of the Relative Accommodation Reserve (RAR) after 3 years, (up to  $-5,14 \pm 0,31$  D - by  $-3,02$  D;  $p < 0,001$ ), compared to the optical correction, where the given index had statistically insignificant dynamics (from  $-2,03 \pm 0,21$  D to  $-2,14 \pm 0,22$  D - with  $-0,11$  D;  $p > 0,05$ ). In the group with low grade myopia and the age of 17-19 years, after three years of orthokeratological treatment RAR changed insignificantly in both groups (up to  $-2,4 \pm 0,22$  D in the control group and up to  $-5,44 \pm 0,38$  D in the main group). In the group with medium-grade myopia and the age of 7-16 years, after three years of orthokeratological treatment, the RAR value increased by 4.4 times (up to  $-5,84 \pm 0,26$  D - by  $-4,51$  D;  $p < 0,001$ ), compared to the control group where the same index increased statistically insignificantly (up to  $-1,42 \pm 0,11$  D (with  $-0,01$  D;  $p < 0,001$ )). In the group with medium-grade myopia and the age of 17-19 years, after three years of orthokeratological treatment, RAR increased (up to  $-5,8 \pm 0,46$  D), but it is much more significant compared to the control group, where the same index was  $-3,37 \pm 0,37$  D ( $p < 0,001$ ). In the group with low-grade myopia and the age of 7-16 years, after three years of orthokeratological treatment, the Absolute Accommodation Volume (AAV) was  $10,34 \pm 0,78$  D in the main group and  $6,3 \pm 0,58$  D in the control group ( $p < 0,001$ ). In the group with low-grade myopia and the age of 17-19 years, after one year of orthokeratological treatment, the AAV value was  $10,12 \pm 0,78$  D in the main group and  $6,61 \pm 0,54$  D in the control group, the differences between groups being

statistically significant ( $p < 0.001$ ). In the group with medium-grade myopia and the age of 7-16 years, after 3 years of orthokeratological treatment, the AAV increased 3.7 times compared to the initial data (up to  $10.15 \pm 0.84$  D - by 5.83 D;  $p < 0.001$ ) versus the control group, where the same index increased statistically insignificantly (up to  $5.1 \pm 0.44$  D (by -0.83 D;  $p > 0.05$ )). In the group with medium degree myopia and the age of 17-19 years, after 3 years of orthokeratological treatment AAV was  $10.32 \pm 0.88$  D), compared to the control group where the same index was  $7.34 \pm 0.67$  D ( $p < 0.001$ ).

**Conclusions:** The study demonstrated the obvious superiority of the orthokeratological treatment on subjective accommodation indices (RAR, AAV) compared to optical correction.