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UŞAQ VƏ YENİYETMƏLƏRDƏ GÖZ TİKLƏRİNİN NEYROOFTALMOLOJİ MÜALİCƏSİNİN XÜSUSİYYƏTLƏRİ

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XÜLASƏ

Məqsəd – uşaq və yeniyetmələrdə göz tiklərinin differensial diaqnostikasının əsasında neyrooftalmoloji müalicəsinin xüsusiyyətlərini qiymətləndirmək.

Material və metodlar
Yaşı 5–17 arasında olan 75 pasiyent (42 oğlan və 33 qız, prepubertal və pubertal dövrlərdə) müayinə olunmuşdur. Bütün uşaqlarda hərtərəfli oftalmoloji müayinə aparılmışdır: görmə itiliyinin təyini, retinoskopiya skiaskopiya, dinamik refraksiyanın müəyyənləşdirilməsi, refraksiya pozğunluqlarının korreksiyası, biomikroskopiya, oftalmoskopiya və ehtiyac olduqda, konyuktival mikrofloranın mikrobioloji analizi.

Nəticələr
Gözdə tik müşahidə olunan 75 pasiyentin 38-də (51%) akkomodasiya spazmı (yüngül astiqmatizmlə), 25-də (33%) bakterial blefarit/xroniki konyunktivit, 25-də (33%) isə hər iki patologiyanın birləşməsi aşkar olunmuşdur. 12 pasiyentdə (12%) hər hansı göz patologiyası müəyyən edilməmiş, onlarda diqqət defisiti və hiperaktivlik sindromu (DDHS) diaqnozu qoyulmuşdur.
Mikrobioloji müayinə nəticəsində bakterial blefarit və ya xroniki konyunktivit ilə 22 pasiyentdə (87%) *Staphylococcus epidermidis*, 3 pasiyentdə (13%) isə *Staphylococcus* aureus aşkarlanmışdır.
Dinamik refraksiya uşaqlarda "Plusoptix A09" refraktometri vasitəsilə siklоplegiyadan əvvəl və sonra (iki dəfə Siklopentolat damızdırıldıqdan sonra) qiymətləndirilmişdir. Müayinə olunan uşaqlar arasında 23-də konvergensiya çatışmazlığı, 15-də isə ekzoforiya müəyyən edilmişdir.

Yekun
Əgər eynək korreksiyası təyin olunduqdan sonra tiklərin intensivliyi azalsa da, tamamilə yox olmursa, müalicəyə qamma-amino yağ turşusu (QAYT, GABA) preparatlarının və neyroleptiklərin əlavə edilməsi daha effektiv nəticələr verə bilər.
Müşahidələrimiz göstərir ki, nevroloji müalicə ilə yanaşı, oftalmoloqun iştirakı ilə kompleks terapiya psevdomiopiya, miopiya və çəpgözlüyün proqressivləşməsinin qarşısını almağa və uşağı arzuolunmaz nevroloji simptomlardan azad etməyə kömək edir.
Gözdə tiklərin erkən və vaxtında differensial diaqnostikası effektiv müalicə nəticələrinin əldə edilməsinə imkan yaradır.

Açar sözlər: *göz tikləri, psevdomiopiya, baş ağrıları*

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FEATURES OF THE NEURO-OPHTHALMOLOGICAL TREATMENT OF OCULAR TICS IN CHILDREN AND ADOLESCENT

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SUMMARY

Purpose – to evaluate the features of neuro-ophthalmological treatment according to differential diagnosis of ocular tics in children and adolescent.

Material and methods

A total of 75 patients aged 5–17 years were examined, including 42 boys and 33 girls of prepubertal and pubertal age. All patients underwent a comprehensive ophthalmological examination: visual acuity assessment, retinoscopy, determination of dynamic refraction, correction of refractive errors, slit lamp biomicroscopy, ophthalmoscopy, and bacteriological culture of the conjunctival sac.

Results

Among the 75 patients with ocular tics, 38 (51%) were diagnosed with accommodation spasm (with mild astigmatism), 25 (33%) had bacterial blepharitis/chronic conjunctivitis, and 25 (33%) had a combination of these conditions. In 12 (12%) patients, no ocular pathology was detected; these children were diagnosed with attention deficit hyperactivity disorder (ADHD).

Microbiological examination revealed the following flora: *Staphylococcus epidermidis* was isolated in 22 patients (87%) with bacterial blepharitis/chronic conjunctivitis, while *Staphylococcus aureus* was identified in 3 patients (13%).

Dynamic refraction was assessed using a Plusoptix A09 refractometer before and after cycloplegia. Among the examined patients, convergence insufficiency was detected in 23 children, and exophoria in 15.

Conclusion

If ocular tics decrease following the prescription of corrective spectacles but do not disappear completely, the addition of gamma-aminobutyric acid (GABA) preparations and neuroleptics may lead to more effective results.

Our observations indicate that, in addition to neurological treatment, a combined therapy involving an ophthalmologist is necessary to prevent the progression of pseudomyopia, myopia, and strabismus, and to relieve undesirable neurological symptoms in affected children.

Early and timely differential diagnosis of ocular tics allows achieving effective treatment outcomes.

Key words: *eye tics, pseudomyopia, headache*

In recent years, the number of children with neuro-ophthalmological disorders has increased significantly. We decided to take a closer look at the diagnostic and therapeutic approach of this group of patients. One of the most common psychoneurological disorders in childhood are tics [1].

Tics are disorders in children manifested by sudden, involuntary movements or sounds. For example, a child suffering from tics may blink repeatedly and rapidly even when the eyes are not irritated. They most often appear between the ages of 3 and 15 and may become more frequent during puberty, with the average onset age being 6–7 years. The prevalence in the pediatric population is 6%–10%. According to the American Academy of Child and Adolescent Psychiatry (AACAP, 2012), up to 10% of preschool and primary school-aged children experience this disorder [2].

In most children (96%), tics appear before the age of 11, and they most frequently manifest as blinking. In 90% of cases, the prognosis for local tics is favorable.

There are several theories regarding the etiology of tics. The psychological theory suggests that tics develop as a response to external psychotraumatic factors, while the biological theory attributes them to neurotransmitter imbalance and hereditary predisposition. Each child has specific situations that can provoke tics (watching television, concentration, emotional overexcitement, etc.).

Naturally, tics may draw excessive attention to the child, affecting their emotional state and self-perception. Some children, when in public, try to suppress the tic voluntarily, which leads to increased psycho-emotional tension and, as a result, more pronounced tics or the appearance of new ones [3].

For differential diagnosis, parents usually consult a pediatric neurologist. Tics often disappear within several months. Nevertheless, parents should monitor changing symptoms closely and attend follow-up appointments with a psychologist.

Recently, more patients have been presenting to us with complaints of frequent squinting, rolling, blinking, rubbing, or widening of the eyes (these are usually parental complaints; children themselves often report eye pain).

Upon examination, such patients often show either disorders of the ocular surface (ocular surface disease - OSD) or accommodative dysfunction, even with normal visual acuity. OSD involves the cornea, conjunctiva, eyelids, meibomian glands, or tear film. Dysfunction of these components can damage the ocular surface and requires prompt recognition and treatment to prevent irreversible complications. Rapid diagnosis and early intervention are crucial for successful management of OSD.

Purpose – to evaluate the features of neuro-ophthalmological treatment according to differential diagnosis of ocular tics in children and adolescent.

Material and methods

The study included 75 children aged 5–17 years, followed over the course of one year (mean age at diagnosis 8.85 ± 3.83 years), who presented with complaints of frequent squinting, rolling of the eyes, blinking, rubbing, or widening of the eyes. At their first visit, they also reported itching, redness, burning, and dryness in the eyes.

A comprehensive ophthalmologic examination was performed in all cases, including: visual acuity assessment, retinoscopy, skiascopy, determination of dynamic refraction, correction of refractive errors, biomicroscopy, and ophthalmoscopy. Biomicroscopy revealed ocular and adnexal pathology; when indicated, additional bacteriological cultures from the conjunctival sac and eyelash samples were taken for microbiological analysis.

To determine the etiological causes of OSD, bacteriological tests were conducted for bacteria, fungi, Chlamydia, and herpes simplex virus types 1 and 2. Eyelash samples were examined for Demodex mites.

The study cohort consisted of 42 boys and 33 girls of prepubertal and pubertal age. Each child was examined every three months throughout the year.

Dynamic refraction was measured using a Plusoptix A09 refractometer (Germany) before and after cycloplegia (two instillations of cyclopentolate). Follow-up examinations assessed the accuracy of optical correction and changes in dynamic refraction, comparing autorefractor data with retinoscopy results.

Orthoptic therapy for vergence disorders was also performed to:

- increase accommodative amplitude;
- improve convergent fusional reserves;
- eliminate functional asymmetry between the eyes;
- using a *Synoptophore* and the "*Rucheyok*" TAK-6.3 device (Russia).

The Synoptophore is a device designed for orthoptic exercises aimed at treating physiological binocular dysfunction. Its capabilities include development of normal fusion and ocular motility, stabilization of binocular vision, enhancement of fusional reserves (the ability to maintain a fused image for extended periods), and improvement of ocular motility.

The Rucheyok TAK-6.3 device is used to train accommodation through sequential monocular presentation of optotypes at varying distances. It is applied for the treatment and stabilization of myopia, relief of accommodative spasm, and prevention of myopia in children and adolescents with weak accommodation.

Results

Our previous studies addressed conjunctivitis, accommodative spasm, and refractive disorders in children with neurological abnormalities [4–6]. In this study, we sought to explore the relationship between the neurological and ophthalmological status of children presenting with tics, in order to differentiate these nosological entities and guide treatment appropriately.

Ophthalmological examination of 75 patients with ocular tics revealed that 38 (51%) had accommodative spasm (with mild astigmatism), 25 (33%) had bacterial blepharitis/chronic conjunctivitis, and 25 (33%) had a combination of both. In 12 (12%) patients, no ocular pathology was found, and attention deficit hyperactivity disorder (ADHD) was diagnosed **(Diagram 1).**

Microbiological studies identified the following flora: Staphylococcus epidermidis in 22 (87%) patients and Staphylococcus aureus in 3 patients (13%).

Therapeutic strategies were determined based on clinical examination data specific to

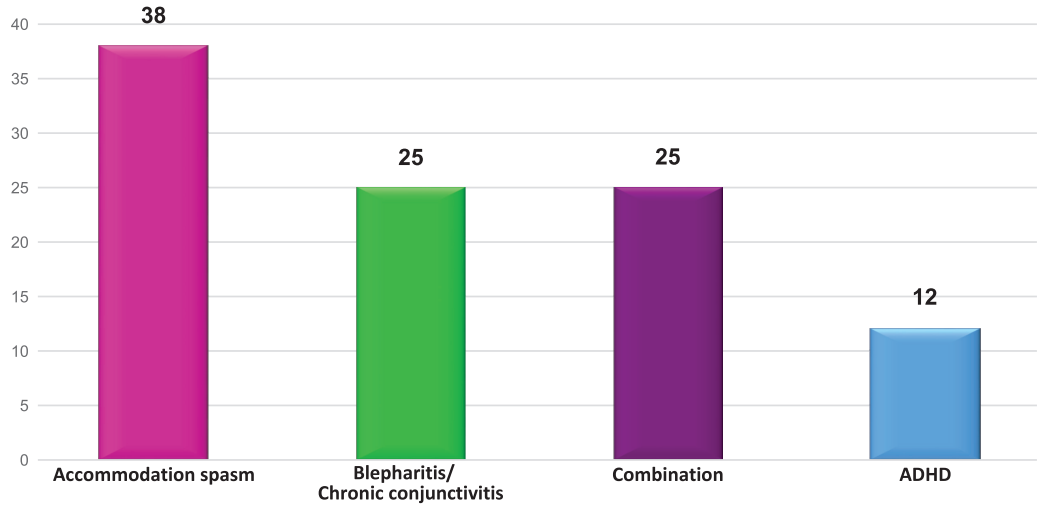

Diagram 1. *Frequency of distribution concomitant conditions in ocular tics.*

this diagnostic group, in collaboration with a pediatrician/therapist. Follow-up assessments were conducted no later than two months after the initial evaluation to determine treatment outcomes.

Etiology-based therapy administered in collaboration with a pediatrician/therapist resulted in the resolution of tic manifestations.

Due to excessive near-work, the most common symptoms of accommodative spasm were blurred and fluctuating vision, ocular deviation, and headaches. In addition, pseudomyopia, exotropia, and miosis were observed as manifestations of hyperactive accommodation.

Since there is a correlation between accommodation and convergence, thorough orthoptic assessment is essential to exclude organic processes that require visual therapy. Convergence insufficiency was detected in 23 (17%) patients and exophoria in 15 (11%) (compensated in all cases). These patients underwent treatment with the Synoptophore and Rucheyok TAK-6.3 devices, resulting in improved accommodative amplitude, enhanced fusional reserves, correction of interocular imbalance, stabilization of the myopic process, and relief of accommodative spasm.

Accommodative disorders are common in individuals exposed to prolonged near-visual tasks – such as programmers, schoolchildren, and students.

In children and adolescents, accommodative dysfunction leads to pseudomyopia and can exacerbate existing refractive errors such as myopia, hyperopia, astigmatism, and amblyopia.

At initial examination, no hypertropia on adduction or V-pattern strabismus was detected, excluding clinically significant overaction of the inferior oblique muscles.

Basic pharmacological treatment of tics included two groups of medications: anxiolytics and agents that reduce motor manifestations. This therapy may be supplemented with drugs that enhance cerebral metabolism, vascular agents, and vitamins. In some cases, dopamine-blocking medications are prescribed [7].

The duration of pharmacotherapy after tic resolution is typically six months, followed by gradual tapering until discontinuation.

Tics appearing between ages 6–8 usually resolve without sequelae. Early-onset tics (ages 3–6) often persist into adolescence but gradually diminish. However, tics that appear before age 3 may indicate a severe underlying disorder, warranting thorough diagnostic evaluation.

Discussion

Recent literature highlights interest in the etiology and management of tics, including their associations with streptococcal infections, allergies, and accommodative spasm [8–10].

Tic disorders are common, especially in children, and boys are preferentially affected [11]. The reported prevalence of individual tic disorders varies widely. A meta-analysis of 35 studies reporting international data collected from 1985 to 2011 suggests that Tourette syndrome, with a prevalence of <1% of school-aged children aged 6-15 years, forms one end of the tic disorder spectrum, while transient tic disorder, with a prevalence of nearly 3% of school-aged children, forms the other [11]. Numerous clinical studies have investigated chronic tic disorders and Tourette syndrome in children; however, ocular tics in the form of frequent blinking, eye rolling, and eye widening have been less frequently explored [12, 13, 14].

Despite numerous studies pediatric ophthalmology, specialists increasingly encounter refractive disorders in this population. This may be attributed to the rapid development of modern digital technologies and children's growing engagement with them. The widespread use of gadgets, video games, and social media has led to a new concern – gadget addiction – defined as uncontrolled device use. Our observations revealed a link between ocular tics and accommodative spasm; treatment by both a neurologist and

ophthalmologist in combination produces the best outcomes.

Children themselves often do not notice their tics and may not understand what is being discussed when asked about them. The main mistake in management is focusing excessive attention on the tics, which reinforces them and prolongs their duration. Psychologists working in educational settings must convey this understanding to parents.

Pharmacological treatment should only be initiated when all non-drug methods fail. Medication choice depends on the clinical picture and additional examination results, aiming to reduce tic severity and improve quality of life. An active lifestyle and regular physical exercise are important adjuncts to pharmacotherapy, as they strengthen the nervous system, reduce stress, and help manage tics [15, 16].

Conclusion

If tics decrease after optical correction but do not disappear completely, the addition of gamma-aminobutyric acid (GABA) preparations and neuroleptics can yield more effective results.

Our observations show that, in addition to neurological treatment, combined management with an ophthalmologist is essential to prevent progression of pseudomyopia, myopia, and strabismus, and to eliminate undesirable neurological symptoms.

Early and timely differential diagnosis of ocular tics enables effective treatment outcomes.

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