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## RATIONALE FOR AN INDIVIDUALIZED APPROACH TO THE TREATMENT OF ORBITAL CELLULITIS IN CHILDREN: A REVIEW

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### Summary.

*Orbital cellulitis represents a significant challenge in ophthalmology, particularly within the pediatric population, given the potential for severe complications, long-term sequelae, and variable treatment outcomes. Management of this condition requires an individualized approach that incorporates established treatment protocols together with evidence from published literature and clinical experience documented in case reports. The aim of this review is to summarize existing evidence and identify current controversies in the treatment of orbital cellulitis in children.*

**Results and their discussion.** *Review of the literature, particularly case reports, confirms that antibiotic therapy remains the primary treatment modality for orbital cellulitis. Initiation of antibiotics within the first three days of symptom onset is associated with a shortened disease course and a reduced likelihood of orbital abscess formation. Immediate administration of intravenous antibiotics is mandatory and may obviate the need for surgical intervention, even in cases presenting with early abscesses.*

*Alternative strategies have been described when antibiotic therapy proves insufficient. One published case report documented successful management of acute orbital cellulitis in a child through the addition of immunoglobulin to a combined surgical and medical regimen. Although the use of immunoglobulin in the context of active infection remains controversial owing to potential immunosuppressive effects, its administration in this case contributed to a favorable outcome despite the lack of response to antibiotic therapy alone.*

*Several authors advocate routine vaccination to prevent orbital cellulitis, a position supported by clinical evidence. Published data demonstrate that routine immunization programs are associated with a reduced incidence of the disease, fewer associated complications, and a decreased need for surgical intervention.*

*The use of corticosteroids in the complex treatment of acute orbital cellulitis in children remains controversial. One of the most frequently discussed potential benefits is that adjuvant corticosteroid therapy in pediatric orbital cellulitis is associated with a shorter duration of hospitalization without serious infectious complications. However, reduction in the duration of hospitalization is an imperfect outcome measure, particularly in the absence of standardized discharge criteria. Therefore, published data indicate insufficient evidence to support the use of corticosteroids in the treatment of periorbital and orbital cellulitis. Given the substantial variation in corticosteroid use in clinical practice, additional high-quality evidence from randomized controlled trials is required to guide informed decisions. Further research is needed to separately evaluate the effects of corticosteroids in children and adults and to assess different dosages and durations of therapy.*

*Orbital cellulitis in children is a relevant problem in pediatric ophthalmological practice. Given the potential for severe complications, disease severity, and long-term sequelae, timely diagnosis, differential diagnosis, and appropriate treatment are particularly important. While therapeutic management can eliminate the infection, careful observation and an individualized approach to the patient are essential.*

**Conclusions.** *1 The management of orbital cellulitis in children must be individualized. 2. The use of immunoglobulin in the complex treatment of acute orbital cellulitis in children is appropriate and contributes significantly to positive clinical dynamics and recovery. 3. Investigation of the mechanism of action of immunoglobulin in the treatment of acute orbital cellulitis in children is relevant and requires further study.*

**Keywords:** *Orbit; Skull; Soft Tissue; Optic Nerve; Eye Anatomy; Retinal Ischemia; Inflammation; Child; Immunoglobulin; Orbital Cellulitis; Preseptal Cellulitis; Ophthalmoplegia; Proptosis (Exophthalmos); Eyelid Edema.*

### Introduction

Orbital cellulitis is an inflammatory process affecting the tissues posterior to the orbital septum within the bony orbit. The term is generally applied to infectious inflammation and is manifested by eyelid erythema and edema, vision loss, fever, headache, exophthalmos, chemosis, and diplopia. Orbital cellulitis commonly arises as a complication of sinus infection, eyelid or facial infection, or hematogenous spread from distant sites [1-6].

Although advances in diagnostic and therapeutic options have reduced the associated morbidity and mortality, orbital cellulitis continues to carry the risk of

serious, vision- and life-threatening complications in the era of modern antibiotics [7-10].

The diagnosis of orbital cellulitis is primarily clinical, based on objective findings in conjunction with presenting signs and symptoms. Proptosis (exophthalmos) is a common presenting feature and is recognized as a key indicator of orbital cellulitis, with severe proptosis serving as an indication for hospitalization. Eyelid edema is frequently one of the earliest signs of periorbital and orbital cellulitis and may progress to chemosis, exophthalmos, and visual impairment [11-16].

Diagnosis can be confirmed by imaging modalities such as computed tomography (CT) and magnetic resonance

imaging (MRI). Due to concerns regarding radiation exposure in children and ongoing controversy over the routine use of imaging, guidelines support its application in the diagnosis of orbital cellulitis [17].

Orbital cellulitis remains a significant problem in ophthalmology, particularly in children, given the potential for complications, long-term sequelae, and variable treatment outcomes. Treatment of this condition requires an individualized approach that accounts for established protocols as well as practical recommendations from published literature and clinical experience documented in case reports.

To summarize existing data on the treatment of this disease, pediatric ophthalmic case reports, scientific observations, and analyses of outcomes in the surgical treatment of acute orbital cellulitis are reviewed.

**Aim of the study:** is to conduct a literature review summarizing existing evidence and identifying current controversies in the treatment of orbital cellulitis in children.

### Results and their discussion

The treatment of orbital cellulitis in children remains relevant and continues to generate controversy. Broad-spectrum antibiotics constitute the cornerstone of therapy. Treatment is initially empirical and is subsequently adjusted according to culture results once they become available.

The causative agents of orbital cellulitis are predominantly bacterial, although polymicrobial infection is common. Pathogens frequently include aerobic and anaerobic bacteria, as well as fungi or mycobacteria. The most common bacterial organisms are *Staphylococcus aureus* and *Streptococcus* species. Rare cases caused by non-spore-forming anaerobes such as *Aeromonas hydrophila*, *Pseudomonas aeruginosa*, and *Eikenella corrodens* have also been reported. Fungal pathogens associated with invasive orbital cellulitis include *Mucorales* (causing mucormycosis) and *Aspergillus* (causing invasive aspergillosis). In immunocompromised patients, mucormycosis and invasive aspergillosis should be considered as potential causes of orbital cellulitis. Mucormycosis primarily affects patients with diabetic ketoacidosis or renal acidosis. Orbital aspergillosis occurs in patients with severe neutropenia or other immunodeficiencies, such as HIV infection. Mycobacterial infection, particularly *Mycobacterium tuberculosis*, is another rarely reported cause of orbital cellulitis.

Published reports indicate that treatment of pediatric orbital cellulitis typically involves intravenous antibiotics when appropriate. In the absence of culture results to guide therapy, knowledge of local microbiology is essential for management. A retrospective case series evaluated local microbiology and antibiotic regimens in patients aged 2 months to 17 years hospitalized for orbital cellulitis. Of 95 patients, 69 (73%) received intravenous antibiotics alone, and 26 (27%) received intravenous antibiotics plus surgical intervention. The most commonly cultured organism was *Streptococcus anginosus*, followed by *Staphylococcus aureus* and group A streptococcus. The prevalence of methicillin-resistant *Staphylococcus aureus*

(MRSA) was 9%. Consequently, antibiotics active against MRSA remain the most commonly used agents in pediatric ophthalmology [18].

Hongguang P. et al. (2016) examined the clinical characteristics, diagnosis, and treatment of orbital cellulitis in children in Shenzhen, China. This retrospective study reviewed data from 20 children admitted to Shenzhen Children's Hospital over a 4-year period with a diagnosis of naso-orbital cellulitis severe enough to require hospitalization. Thirteen participants (65%) were boys and 7 (35%) were girls. The median age was 3.5 years (range 2 months to 7.2 years). The relationship between serum C-reactive protein (CRP) levels, white blood cell count, and duration of hospitalization was analyzed. Patients were divided into two groups based on treatment protocol: those receiving cefoperazone and sulbactam sodium combination and those receiving other antibiotic regimens. Serum CRP levels at hospitalization ( $29.8 \pm 22.0$  mg/L) were positively correlated with duration of hospitalization ( $6.3 \pm 4.1$  days;  $r = 0.46$ ,  $P < 0.05$ ). The time required for CRP levels to return to normal after hospitalization ( $3.4 \pm 1.8$  days) was also significantly correlated with duration of hospitalization ( $(6.3 \pm 4.1)$  days) ( $r = 0.81$ ,  $P < 0.01$ ). Duration of hospitalization was significantly shorter ( $4.3 \pm 1.7$  days) in patients whose CRP normalized within 3 days after antibiotic treatment compared with others ( $9.1 \pm 5$  days;  $t = 2.61$ ,  $P < 0.05$ ). Duration of hospitalization was significantly shorter ( $4.3 \pm 1.9$  days) in patients ( $n = 12$ ) receiving cefoperazone and sulbactam sodium combination compared with those ( $n = 8$ ) receiving other antibiotic regimens alone ( $9.3 \pm 4.7$  days;  $t = 2.83$ ,  $P < 0.05$ ). Bacterial pathogens were identified in 4 patients (20%), including 3 cases of *Staphylococcus aureus* and 1 case of *Streptococcus anginosus*. Acquired methicillin-resistant *Staphylococcus aureus* (MRSA) was detected in three purulent cultures. The authors concluded that early and effective antibiotic treatment within the first three days can shorten the course of naso-orbital cellulitis and potentially prevent the formation of orbital abscesses. Clinical factors significantly associated with patient recovery included improvement in clinical signs and normalization of blood C-reactive protein levels. The authors suggest that the combination of cefoperazone and sulbactam sodium is effective and should be recommended for the treatment of pediatric orbital cellulitis [19].

Miranda-Barrios J. et al. (2021) conducted a retrospective review of patients admitted to a tertiary hospital with orbital cellulitis and investigated key differential characteristics of preseptal and orbital cellulitis. Early computed tomography was performed in 75.6% of cases of suspected orbital cellulitis and aided in the detection of complications at an early stage. Abscesses were detected in 70.6% of cases, particularly medial subperiosteal abscesses (58.8%). All patients received intravenous antibiotics, while corticosteroids were preferred in patients with orbital involvement (8.6% vs. 73.3%,  $P < 0.001$ ). Only 26.7% of patients required additional surgery.

The authors concluded that the clinical picture and C-reactive protein level are highly sensitive for the differential diagnosis of preseptal and orbital cellulitis. Immediate initiation of intravenous antibiotics is mandatory

and may prevent surgical intervention even in cases of initial abscesses [20].

Bedwell and Bauman (2011) report that contrast-enhanced computed tomography remains the preferred modality for assessing orbital inflammation. According to the original classification by Chandler, orbital inflammation continues to be categorized as preseptal or postseptal; almost all cases of preseptal cellulitis are managed with oral antibiotics. Most cases of postseptal cellulitis require intravenous antibiotic therapy, although surgical intervention is indicated for certain abscesses, particularly those of significant size. Patients under 9 years of age demonstrate a higher likelihood of responding to medical management than older individuals. However, recent studies suggest that even children over 9 years of age presenting with small-to-moderate abscesses and preserved vision merit a trial of medical therapy prior to surgical intervention. Medial subperiosteal abscesses refractory to medical management are typically drained endoscopically, whereas lateral or intraconal abscesses require open surgical procedures [21].

Burek (2021) states that pediatric orbital cellulitis may result in vision loss, intracranial extension, or cavernous sinus thrombosis if prompt treatment is not initiated. It is noted that generally accepted clinical guidelines for the medical management of this condition remain unavailable. Given that methicillin-susceptible *Staphylococcus aureus* was identified as the most common pathogen (26.3%) among 220 patients, annual vancomycin utilization rates ranged from 40.9% to 84.6%. Surgical intervention was performed in 39.5% of the patient population. Corticosteroids, administered to 70 patients (32.1%), were not associated with treatment failure ( $n = 9$ ), which was defined as persistent clinical signs or initial improvement followed by subsequent deterioration ( $P = 0.137$ ); the duration of antibiotic therapy was 17 days. Consequently, the empirical use of vancomycin was high. Treatment failure was rarely observed in patients treated for 2 weeks, suggesting that a shorter duration of therapy may be adequate for certain individuals [22].

According to Danishyar et al. (2023), the absence of adequate diagnostics and appropriate treatment may facilitate the progression of orbital infection and its dissemination to adjacent anatomical sites, resulting in severe complications. These complications include vision loss, subperiosteal abscess, orbital abscess, and intracranial dissemination of the infection. The antibiotic regimen must include anaerobic coverage if intracranial involvement is suspected. Antifungal agents are indicated only in cases where fungal infection is suspected within appropriate clinical contexts. Orbital complications are reported to account for 74-85% of all complications associated with acute sinusitis in the pediatric population and may be devastating. Although preseptal and postseptal cellulitis are typically managed conservatively, orbital abscess and cavernous sinus thrombosis necessitate surgical intervention.

The literature further indicates that orbital cellulitis, particularly when complicated by subperiosteal abscesses in children, does not constitute an absolute indication for immediate surgical intervention. Conservative management may be both safe and effective if implemented correctly,

depending on the clinical course and diagnostic imaging findings [23].

The experience of treating children with orbital cellulitis was described by Shifman et al. (2022). A retrospective analysis of hospital records of pediatric patients with orbital cellulitis was conducted for the period from 2005 to 2018. Clinical, laboratory, and radiological characteristics, as well as therapeutic and microbiological data, were collected. Painful limitation of ocular motility was observed in 37.2% of 94 patients, and exophthalmos was noted in 34%, while both pathognomonic manifestations were present in only 18% of the children. Patients older than 9 years of age exhibited significantly elevated inflammatory markers, specifically leukocytosis and C-reactive protein (CRP). Functional endoscopic sinus surgery was required in only 12 (12.4%) cases. Consequently, the researchers corroborate the general consensus that orbital cellulitis should initially be managed conservatively with rigorous monitoring, as surgical intervention is necessitated only in a minority of patients [24].

An analysis of 122 cases was performed by Santos et al. (2019), of which 80.3% presented with preseptal cellulitis and 19.7% with orbital cellulitis. The median age of the patients was 5 years. Sinusitis was identified as the most frequent risk factor (40.2%), followed by dental abscess (20.4%) in cases of preseptal cellulitis and external ocular infections (12.5%) in orbital cellulitis. Sinusitis ( $p < 0.001$ ) was significantly associated with orbital cellulitis, whereas patients with dental abscess ( $p = 0.007$ ) and trauma ( $p = 0.040$ ) were more likely to present with preseptal cellulitis. Clinical symptoms, including fever, photophobia, ocular pain, painful ocular motility, exophthalmos, rhinorrhea, and visual disturbances, were associated with orbital cellulitis. Leukocytosis was present in 34.4% of patients and was associated with orbital cellulitis ( $p = 0.001$ ). Computed tomography was performed in nearly half of the patients (49.2%). Systemic corticosteroids were administered in 19.7% of cases. Complications were observed in 13 patients. Follow-up computed tomography scans were performed in 6.6% of cases; no clinical deterioration was observed, and surgical intervention was required in 1.6% of patients. Thus, the presence of orbital involvement is suggestive of orbital cellulitis. The significance of dental abscess as a contributory factor in the development of preseptal cellulitis is emphasized. Repeated examinations did not appear to influence therapeutic management or clinical outcomes. Consequently, a high proportion of patients received corticosteroids, notwithstanding the controversial nature of their administration [25].

An analysis of the literature by Lu (2023) concludes that pediatric orbital cellulitis is primarily managed with antibiotics, a strategy that may leave the inflammatory component unaddressed. Corticosteroid therapy is utilized to expedite recovery and mitigate long-term morbidity in other infectious conditions; its administration has also been proposed for pediatric orbital cellulitis.

In general, previous studies investigating corticosteroid therapy in pediatric orbital cellulitis are constrained by study design and limited sample sizes. A prominently discussed potential benefit is that adjuvant corticosteroid therapy for pediatric orbital cellulitis is associated with a reduced duration of hospitalization without the occurrence

of serious infectious complications. However, the reduction in the duration of hospitalization represents an imperfect metric, particularly in the absence of standardized discharge criteria. Further studies are required to provide better guidance for the administration of adjuvant corticosteroid therapy and to optimize its potential in the management of pediatric orbital cellulitis [26].

Williams (2019) reported that vaccination against *Haemophilus influenzae* resulted in a shift in the prevalent pathogens associated with preseptal and orbital cellulitis. The management of orbital cellulitis was enhanced by adjuvant corticosteroid therapy, and a subperiosteal abscess volume exceeding 1250 mL was identified as a predictor of the potential requirement for surgical intervention [27].

It is contended by Chew (2022) that orbital cellulitis constitutes a rare condition posing a risk to both vision and life. The author reports a potential etiology for the development of orbital cellulitis in a 14-year-old male, occurring in the absence of cutaneous injury or osseous fractures, involving a rare pathogen. The patient developed a facial abscess and progressive orbital cellulitis following blunt facial trauma, necessitating functional endoscopic sinus surgery combined with external aspiration of the facial abscess. Microbiological cultures demonstrated the growth of *Streptococcus constellatus* and *Parvimonas micra*; the patient subsequently received further antibiotic therapy, resulting in a complete recovery. The pathophysiology of orbital cellulitis in this case is attributed to vascular stasis and localized pressure from the maxillofacial fossa and maxillary hemosinus, alongside impaired ventilation of the paranasal sinuses, which facilitates the proliferation of anaerobic bacteria. Further progression resulted in the formation of a facial abscess and intraorbital dissemination, manifesting as orbital cellulitis. Pediatric patients are predisposed to trauma, and the self-reporting of symptoms may be delayed. Consequently, during the management of maxillofacial injuries, it is imperative to maintain a high index of suspicion for complex trauma and orbital cellulitis to facilitate the prompt initiation of therapy [28].

Kornelsen et al. (2021) emphasize that periorbital and orbital cellulitis represent infections of the tissues located anterior and posterior to the orbital septum, respectively, and clinical differentiation between these entities may be challenging. Furthermore, periorbital cellulitis may progress to orbital cellulitis. The latter exhibits a relatively high incidence in both pediatric and adult populations and is associated with potentially severe consequences, including vision loss, meningitis, and mortality. Complications arise, in part, from inflammatory edema secondary to the infection, which induces a compartment syndrome within the bony orbit. This results in increased intraocular pressure and compression of the orbital vasculature and the optic nerve. Although corticosteroids are utilized in other infectious conditions to mitigate inflammation and edema, their potential to suppress the immune response and exacerbate the clinical course of infection remains a concern.

To evaluate the efficacy and safety of adjunctive corticosteroid therapy for periorbital and orbital cellulitis in pediatric and adult populations, a systematic search of the Cochrane Central Register of Controlled Trials (CENTRAL) was conducted. The search identified 7998 records, of

which 13 were selected for full-text screening. The included study compared the administration of corticosteroids in conjunction with antibiotics against antibiotic therapy alone for the treatment of orbital cellulitis. A total of 21 participants aged 10 years and older were enrolled; 14 participants were randomized to the corticosteroid and antibiotic group, and 7 participants received antibiotics alone. Participants in the intervention group received adjunctive corticosteroids following an initial clinical response to antibiotics (mean 5.13 days) at an initial dose of 1.5 mg/kg for 3 days, followed by 1 mg/kg for an additional 3 days, with a subsequent gradual dose tapering over 1 to 2 weeks. Consequently, the authors concluded that there is insufficient evidence to establish definitive conclusions regarding the use of corticosteroids in the management of periorbital and orbital cellulitis. Given the considerable variation in clinical practice, further high-quality randomized controlled trials are necessitated to inform clinical decision-making. Future research should independently investigate the effects of corticosteroids in children and adults, while evaluating various dosages and therapeutic timing [29].

The incidence of pediatric orbital cellulitis associated with *Haemophilus influenzae* following the routine administration of the *H. influenzae* vaccine in Saudi Arabia was evaluated by Alsulaiman and Al-Faky (2022), who also identified prevalent pathogens, risk factors, associated complications, and the requirement for surgical intervention. The findings indicate that the vaccine is effective in eliminating orbital cellulitis potentially associated with *H. influenzae*. The most frequently identified pathogens were Gram-positive staphylococci and streptococci. Sinusitis remains the primary etiology of orbital cellulitis in the pediatric population. In certain instances, pharmacological management may eradicate the infection; however, rigorous clinical observation is mandatory [30].

It is recognized that the acute phase of the disease and long-term outcomes necessitate strict adherence to established treatment protocols. In a documented case study, the adjunctive administration of immunoglobulin was utilized within a complex surgical treatment regimen for acute orbital cellulitis in a child. Although the potential for immunosuppression during active infection remains a subject of debate, the administration of immunoglobulin in this specific pediatric case was deemed appropriate and decisive. A male patient (aged 1 year, 8 months) was hospitalized for 16 days with a diagnosis of acute orbital inflammation. Upon admission, the patient's condition was severe, characterized by both systemic and localized manifestations. The therapeutic regimen included systemic antibiotic therapy, nonsteroidal anti-inflammatory drugs, analgesics, and symptomatic treatment. However, the general condition remained severe without clinical improvement during the initial 3 days. On the 4th day of hospitalization, orbital drainage was performed, yielding a small volume of serous exudate; microbiological cultures remained sterile. Following a recurrent febrile episode, alternative antibiotics were prescribed, yet the clinical status remained unchanged. Consequently, on the 9th day, immunoglobulin (three consecutive daily doses) was added to the conservative therapy. Positive clinical dynamics – including defervescence, improvement

in systemic and localized status, and normalization of laboratory parameters – were observed on the day following the initial dose. The patient was discharged in satisfactory condition on the 16th day of hospitalization. Thus, it is contended that the use of immunoglobulin in the complex management of acute pediatric orbital cellulitis is appropriate and facilitates recovery. Furthermore, the development of treatment algorithms incorporating immunoglobulin supplementation is promising regarding the clinical prognosis [31].

In summary, orbital cellulitis represents a significant challenge in pediatric ophthalmological practice. Given the associated complications, disease severity, and long-term sequelae, the issues of timely diagnosis, differential diagnosis, and therapeutic adequacy are of paramount importance. Based on the analysis of current scientific literature and clinical cases, it is evident that the management of pediatric orbital cellulitis must be individualized. Particular emphasis must be placed on clinical manifestations, objective status, localized findings, and laboratory and instrumental diagnostic data, with rigorous monitoring of disease dynamics. Systemic antibiotic therapy is mandatory in complex treatment, as substantiated by scientific and practical publications. Based on our observations, the insufficient efficacy of antibiotic therapy necessitates the development of new therapeutic algorithms involving adjunctive immunoglobulin correction, which remains promising in terms of prognosis.

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## Conclusions

1. The management of orbital cellulitis in children must be individualized.

2. The administration of immunoglobulin in the complex treatment of acute pediatric orbital cellulitis is appropriate and significantly facilitates positive clinical dynamics and recovery.

3. Investigations into the mechanism of action of immunoglobulin in the treatment of acute pediatric orbital cellulitis are relevant and necessitate further research.

**Prospects for further research.** Comprehensive literature review is required to evaluate existing evidence regarding immunoglobulin efficacy in pediatric orbital cellulitis management.

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**Conflict of interest.** The authors declare that there is no conflict of interest.

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## ОБГРУНТУВАННЯ ЕФЕКТИВНОСТІ ТА НЕОБХІДНОСТІ ІНДИВІДУАЛЬНОГО ПІДХОДУ У ЛІКУВАННІ ОРБИТАЛЬНОГО ЦЕЛЮЛІТУ У ДІТЕЙ (ОГЛЯД ЛІТЕРАТУРИ)

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### Резюме.

Орбітальний целюліт є актуальною проблемою в офтальмології, особливо в дітей, враховуючи можливі ускладнення та наслідки лікування, а також віддаленні результати лікування. На нашу думку, лікування цієї патології потребує індивідуального підходу щодо конкретного пацієнта, враховуючи протоколи лікування, а також практичні рекомендації науковців та особливо практичних лікарів, беручи до уваги випадки з практики. Метою є проведення огляду літератури, щоб узагальнити існуючі докази та зрозуміти поточні суперечки щодо лікування орбітального целюліту у дітей.

**Результати та їх обговорення.** Провівши ретельний огляд літературних джерел, особливо випадків з практики, стало очевидно, що антибіотикотерапія є методом вибору і раннє лікування антибіотиками протягом перших трьох днів може скоротити перебіг орбітального целюліту та потенційно запобігти утворенню орбітальних абсцесів. Також негайний початок внутрішньовенного введення антибіотиків є обов'язковим і може запобігти хірургічним втручанням навіть у випадках початкових абсцесів. Але відомо і інший підхід у лікуванні, коли антибіотикотерапія була неефективною. В одному з представлених випадків ми висвітлили окремих клінічний випадок гострого орбітального целюліту у дитини із застосуванням імуноглобуліну в комплексному хірургічному лікуванні. Хоча потенціал імуносупресії за наявності інфекції викликає суперечки, проте у даному випадку призначення імуноглобуліну в комплексному лікуванні орбітального целюліту у дитини було доречним і визначальним на фоні відсутності терапевтичного ефекту антибіотикотерапії. Деякі автори стверджують також і доцільність вакцинації в плановому порядку з метою попередження захворювання, що підтверджується на практиці. Лікарі-науковці відмічають позитивну динаміку після планового введення вакцини, а також усунення факторів ризику, пов'язаних з ускладненнями та необхідністю хірургічного втручання. Суперечливим питанням залишається дотепер призначення кортикостероїдів у комплексному лікуванні гострого орбітального целюліту у дітей. Однією з найбільш обговорюваних потенційних переваг є те, що ад'ювантна стероїдна терапія дитячого орбітального целюліту пов'язана з коротшим терміном госпіталізації без серйозних інфекційних ускладнень. Однак скорочення тривалості госпіталізації є недосконалим показником, особливо без стандартизованих критеріїв виписки зі стаціонару. Отже, за висновками авторів, немає достатньої кількості доказів щодо використання кортикостероїдів у лікуванні періорбітального та орбітального целюліту. Оскільки існують значні відмінності у методах використання кортикостероїдів у клінічній практиці, необхідні додаткові високоякісні докази з рандомізованих контрольованих досліджень для прийняття обґрунтованих рішень. Тому стає необхідною проведення наукових

досліджень з метою детального вивчення впливу кортикостероїдів на дітей та дорослих, а також оцінки різного дозування та тривалості кортикостероїдної терапії. Отже, підсумовуючи очевидно, що орбітальний целюліт у дітей є актуальною проблемою в дитячій офтальмологічній практиці. Враховуючи ускладнення захворювання, їх важкість перебігу та наслідки, особливо важливим постає питання своєчасної діагностики, диференційної діагностики та адекватності лікування. Безумовно, медикаментозне лікування може усунути інфекцію, проте необхідне ретельне спостереження та індивідуальний підхід щодо конкретного пацієнта.

**Висновки.** 1. Лікуванні орбітального целюліту у дітей має бути індивідуальне щодо конкретного пацієнта. 2. Застосування імуноглобуліну в комплексному лікуванні гострого орбітального целюліту у дітей є доцільним та значно сприяє позитивній динаміці та одужанню. 3. Дослідження механізму впливу імуноглобуліну при лікуванні гострого орбітального целюліту у дітей є актуальним та потребує подальшого вивчення.

**Ключові слова:** орбіта; череп; м'які тканини; зоровий нерв; око; анатомія; ішемія сітківки; запалення; дитина; імуноглобулін; орбітальний целюліт; пресептальний целюліт; офтальмоплегія; проптоз (екзофтальм); набряк повік.

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