CASE REPORT

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Accommodation Spasm Following Tetanus Diphtheria (Td) Vaccination

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ABSTRACT

Accommodation spasm is a rare condition that presents with pseudomyopia usually in children and young adults. Most of the cases are associated with emotional conditions that causes functional spasm. Sometimes, an underlying organic cause can be detected. Tetanus-diphtheria vaccine (Td) is a combined vaccine in toxoid form and performs to prevent infectious diseases caused by Clostiridium tetani and Corynebacterium diphtheriae, respectively. In this case report, we present the clinic features of a 13-year-old girl who applied with decreased vision after Td vaccination and diagnosed with isolated accommodation spasm.

Key Words: Accommodation spasm, Tetanus, Diphtheria, Vaccine

Introduction

Near reflex is consist of miosis, convergence and accommodation. Near reflex spasm is the combination of miosis, convergent strabismus and accommodation spasm. (1) These pathologies can be seen in different combinations and varying degrees. Accommodation spasm is a relatively rare entity in accommodation disorders. There is usually an emotional condition that triggers, but rarely, there may be an underlying organic pathology. According to our knowledge, this is the first case report of accommodation spasm following tetanus-diphtheria (Td) vaccination.

Case Report

A 13-year-old girl admitted to the Ophthalmology Clinic of the Faculty of Medicine of Van Yuzuncu Yil University in the evening with a complaint of decreased vision. She said that her complaints had begun after the Td vaccination at school that day. There was no history of any illness or drug use. On the ophthalmologic examination, visual acuity with Snellen chart was hand motion in the right eye and in the level of 0.1 in the left eye. Eye movements were naturally seen in every direction. Orthophoria was observed at near and far. No miosis was observed. Autorefraction values (NIDEK ARK 510A, Japan) were -8.00 (-0.50x170) in the right eye and -10.25 (-0.50x165) in the left eye. After 45 minutes, the refraction value was -0,75 (-0,25x170) and (-0,50x175) on the right and left, respectively, when 1% cyclopentolate was dropped 3 times with 5 minutes intervals in both eyes. Visual acuity bilateral increased to 0,3 without correction and to 0,6 with correction. The anterior and posterior segment examinations were naturally observed. Axial length measurement was measured with an optical biometry device (EyeSuiteTMIOL, V4.1.1, Haag-Streit, Switzerland) and was 21,98 mm on the right and 21,86 mm on the left. The lens thickness couldn't be measured on the right eye and was 3.75 mm on the left eye. Conservative follow-up was planned. The patient's complaints improved in a few days.

After three months, the uncorrected visual acuity was bilaterally 0.8 and the best corrected visual acuity was bilaterally 1.0. The autorefraction values were -0,75 (-0,75x175) on the right and -0,25 (-0,50x175) on the left. After 45 minutes, the refraction value was -0,50 (-0,75x180) and (-0,50x180), respectively, when 1% cyclopentolate was dropped 3 times with 5 minutes intervals in both eyes. Eye movements were naturally seen in every direction. There was no ocular misalignment. No miosis was observed. Axial length measurement was measured with the optical biometry device (EyeSuiteTMIOL, V4.1.1, Haag-Streit, Switzerland) and was found to be 21.98 mm on the right and 21.88 mm on the left.

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Lens thickness could not be measured on the right and measured to be 3.42 mm on the left.

Discussion

Accommodation spasm is a clinical diagnosis that pseudomyopia resolves after cycloplegia. As in our case, patients are usually healthy individuals in other ways. Sudden onset, transient or permanent, varying degrees of decrease or fluctuation occurs in visual acuity. Patients may present also with complaints of fatigue in eyes, headache and diplopia. In ophthalmologic examination, convergent strabismus and miosis can be seen as well as pseudomyopia that resolves with cycloplegia. Restriction of abduction can be observed when both eyes are open, these patients may be exposed to unnecessary further examination with abducens paralysis or ocular myasthenia. Restriction of abduction and miosis accompanying near reflex spasm disappear when the other eye is closed. In our case, there was a sudden onset decreased vision. Esotropia, limitation of abduction and miosis didn't determine. Accommodation spasm is typically bilateral but unilateral cases also has been reported. (2)

Accommodation spasm is generally in functional nature that is triggered by emotional stress or simulation. The underlying organic cause is usually in form of case reports in the literature and includes neurosyphilis, ocular inflammation, Raeder's paratrigeminal neuralgia syndrome, cyclic oculomotor paralysis, congenital ocular motor apraxia, congenital horizontal gaze, pineal tumor, Chiari malformation, pituitary tumor, metabolic encephalopathy, vestibulopathy, Wernicke-Korsakoff syndrome, cerebellar lesions, myasthenia gravis, acute stroke(3), multiple sclerosis (4), idiopathic intracranial hypertension (5), disruption of normal binocular vision (6), nystagmus blockage syndrome (7), head trauma (8,9), generalized photosensitivity epilepsy (10) and spinal injury (11). Imaging methods are used in the event of a systemic disease or neurological symptoms. We did not need to carry out further investigation because the possible trigger factor was obvious in our case.

Conservative follow up, cyclopentolate drops or atropine drops with bifocal glasses, clear lens extraction and intraocular lens implantation, electrostimulation and magnetotherapy can be chosen as patient-based methods in the treatment of accommodation spasm. Treatment of underlying cause may resolve accommodation spasm. (5)

Tetanus and diphtheria are two serious infectious diseases that can be largely prevented by vaccination. As in our case, the vaccine that have been applied, prepared with tetanus and diphtheria toxoids, is given to students in grade 8 as booster dose, in Turkey.

Cases that developed secondary complications to combination of tetanus, diphtheria and acellular pertussis vaccines located in the literature include acute disseminated encephalomyelitis, chronic inflammatory disseminated polyneuropathy, transverse myelitis, acute myelogenous leukemia, anemia, anaphylaxis, chronic urticaria, arthropathy, serum disease, type 1 diabetes mellitus, myocarditis, fibromyalgia, sudden infant death syndrome, immune thrombocytopenic purpura, encephalitis, infantile spasm, epilepsy, multiple sclerosis, Bell's paralysis, opsoclonus-myoclonus syndrome have been screened in aspect of evidence-causality and only convincing evidence was found between TT (Tetanus Toxoid) vaccine and anaphylaxis.(12)

A detailed anamnesis and clinical examination are important for not to skip an underlying organic pathology, although functional causes are notably frequent in the etiology of accommodation spasm. Although cause of accommodative spasm in our case is considered to be primarily in functional nature triggered by emotional stress, it is noteworthy that accomodation spasm developed post-injection of vaccine which is prepared with toxoids of C. tetani and C. diphtheria. Because, these organisms can be causative agents of spasm (C. tetani) or neuropathy (C. diphtheria) in muscle groups.

Patient Consent: The patient consented to the publication of this case in writing, with the assurance given that no personal information was included, and that they would not be identifiable.

Conflict of Interest: The authors declare that there is no conflict of interest regarding the publication of this article.

Author Contributions: All authors contributed to the research, collection, and writing of this paper.

Data Availability Statement: No datasets were generated or analyzed during the current study.

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