

# EVALUATION OF EXCESSIVE BLINKING IN CHILDHOOD

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**Abstract-** Abnormalities of blinking in childhood are not uncommon. To determine the characteristics and causes of excessive blinking, this prospective, non-comparative consecutive case series study was carried out. In outpatient clinics of ophthalmology and neurology of our hospital, 60 children aging 2-16 years old with excessive blinking were examined. Detailed ophthalmologic and neurologic evaluation (history and physical examination) was done and etiology of excessive blinking and demographic characteristics of patients were determined. Of 60 children, 39 (65%) were male and 21 (35%) female. The most common causes were habitual tic in 25 (41.7%), uncorrected refractive error in 20 (33.3%), ocular surface abnormalities such as blepharitis in 6 (10%), psychogenic in 6 (10%) and central nervous system diseases in 3 (5%) cases. Excessive blinking in pediatric age group may occur because of a large number of potential problems. Most cases are caused by benign and self-limiting conditions. The causes can usually be determined after careful history and clinical examination. Neuroimaging techniques are not necessary to be done routinely.

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**Key words:** Excessive blinking, Childhood, Neurologic diseases

## INTRODUCTION

Abnormalities of blinking in childhood are not uncommon. The normal blink response consists of two components, best demonstrated by an electrically stimulated blink reflex. The blink reflex is mediated by trigeminal nerve afferents and facial nerve efferents. There is an early ipsilateral response ( $R_1$ ), which is transmitted through an oligosynaptic pontine pathway, and a late bilateral response ( $R_2$ ) relayed through a polysynaptic medullar arc. There is also a recovery curve that can be measured with each response (1). Evaluation of blink reflex can be useful in examining patients with systemic disease, for example in detecting brainstem dysfunction in

patients with cerebral palsy due to neonatal asphyxia and in partial seizure (2-4).

Causes of increased frequency of blinking can be categorized into several groups, including eye blinking tics, blepharospasm and excessive blinking due to ocular surface disorders.

Eye blinking tics usually occur in normal eyes of boys, can be controlled voluntarily and usually are self-limited (5); blepharospasm usually occurs in adults and is more common in females and excessive blinking may be secondary to ocular surface disorders such as blepharitis and dry eye.

Some authors have proposed that all types of increased frequency of blinking may share a common pathophysiologic mechanism with clinical expression being the variable dependent on age (6). In the majority of children, especially in school aged children, excessive blinking causes a significant social handicap.

The purpose of this prospective study was to analyze causes and characteristics of children who complained of excessive blinking.

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## MATERIALS AND METHODS

A prospective case series study was conducted on children who presented to outpatient clinics of ophthalmology and neurology of our hospital with excessive blinking as their chief complaint. The study was carried out from April 2001 to April 2002. Verbal consent was obtained from the parent(s) of each patient. All patients were 16 years of age or younger, with chief complaint of excessive blinking. Patients with lid malposition (ptosis, retraction), strabismus or any other ocular structural disease were excluded from the study.

Collected data included age, sex, duration and frequency of signs and symptoms, associated signs and symptoms and exacerbating conditions were questioned and recorded on a standardized data collection form. Past medical, social and psychiatric histories were obtained and review of systems was carried out.

A complete ophthalmologic examination was performed, including measuring visual acuity (depending on age), cycloplegic refraction, extraocular motility evaluation, slit lamp examination and fundoscopy. An assessment of excessive blinking was made during the examination and we tried to stimulate blinking with shining a bright light, by instructing lateral eye movement or gentle tapping on the forehead.

After initial assessment the patients referred to pediatric neurologist for evaluation and neurologic examination. Neuroimaging was ordered on patients who had a history of, or other signs and symptoms suggesting the potential for new or worsening neurologic diseases and in patients who had an increase of symptoms at the 3 months follow up appointments.

Initial and follow-up diagnosis and test results were evaluated for each patient. Habitual tics were diagnosed only after other potential diagnoses were ruled out and problem resolved spontaneously. The diagnosis of psychogenic blepharospasm was made when no other obvious diagnosis was present and the excessive blinking started with stressful conditions to the child.

All patients were followed for at least 3 months later by phone or visit.

## RESULTS

A total of 60 children were enrolled in the study including 39 (65%) males and 21 (35%) females. The mean age was 10 years (3.5-16years). All patients presented with complaints of bilateral excessive blinking. Associated signs and symptoms in our patients included face and body abnormal movements in 30 (50%), photophobia in 28 (47%) and depression in 6 (10%). In 4 (7%) cases family history of excessive blinking was positive. The mean duration of symptoms before presentations was 5.2 months (7 days to 15 months). The examining ophthalmologist witnessed the abnormal blinking in all 60 patients. Twenty five (41.7%) had habitual tic, 20 (33.3%) uncorrected refractive error, 6 (10%) anterior segment diseases (blepharitis and/or dry eye), 6 (10%) psychogenic blinking and 3 (5%) central nervous system diseases (seizure controlled with medications).

In 20 patients with uncorrected refractive errors glasses were prescribed and excessive blinking resolved in two months follow-up, confirming the diagnosis. Six (10%) patients with anterior segment abnormalities were treated with appropriate medications. In 6 (10%) case of excessive blinking was psychogenic spasm (initiated and exaggerated in stressful conditions).

All patients were followed for at least 3 months by phone or visit; in 50 (83.3%) patients condition improved completely, in 5 (8.3%) improvement was mild to moderate and in 5 (8.3%) no change was seen. None worsened, and none developed other associated signs or symptoms.

## DISCUSSION

Review of abnormal blinking in children is infrequently reported in literature and little guidance exists on how to evaluate and manage children with excessive blinking. Normal blink rate in pediatric age group increases from 1-4 / minute in neonatal age to 10-12 /minute in adolescence age, a rate that remains unchanged throughout life. Blinking increases with verbal conversation and decreases with reading (6, 7).

Habitual tic was the most common diagnosis in our study, found in 25 (41.7%) children with a male to female ratio of 2.3:1. It was improved in 20 (80%) cases after 3 months follow up. It was diagnosed retrospectively after spontaneous improvement without any medication and only with reassurance to patient and his (her) parents. Vrabec *et al.* also reported a high spontaneous resolution rate in children with excessive blinking (6). Uncorrected refractive error was the second most common diagnosis in our study, found in 20 (33.3%) children with a male to female ratio of 2.7:1. It was diagnosed after improvement was seen in all of them with correction of refractive error with glasses. Coats *et al.* reported 89.5% improvement of excessive blinking in children with uncorrected refractive error (1).

Anterior segment diseases of eye are common causes of excessive blinking (7, 8). In this study 6 (10%) of children had blepharitis and/or dry eye that were treated appropriately and in 4 (66.7%) of them excessive blinking disappeared. Coats *et al.* reported that ocular surface disorders were the etiology of 33% of their cases (1). Functional blepharospasm or psychogenic blepharospasm accounted for 6 (10%) of children in our study. A variety of situational disorders were associated with psychogenic blepharospasm, most commonly adjustment to a new environment such as new school or school examination. After 3 months it disappeared in 4 (66.7%) of cases. Coats *et al.* reported a prevalence of about 10% for psychogenic blepharospasm in their study on 99 children with excessive blinking (1).

Excessive blinking is a common finding in children with seizure disorders (4). We found concurrent or historical evidence of neurologic diseases in 3 (5%) of our patients. In all 3 children, seizures were under control with medications. In our study, there was no vision-threatening or life-threatening cause for excessive blinking.

In conclusion, we found that bilateral excessive blinking was a benign, usually self-limited condition that can be diagnosed accurately in the majority of children with careful history and physical examination. This condition only needs reassurance in most cases and correction of uncorrected refractive error or ocular surface abnormalities. So, extensive neurologic evaluation of children with excessive blinking is unnecessary unless the condition is progressive or unless other neurologic signs and symptoms are present.

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