St. Cyril and St. Methodius University of Veliko Tarnovo
Center for Psychological Research and Counseling

1/2026

DOI: 10.54664/WMWC8784

A TODDLER WANTED TO COMMUNICATE BUT REMAINED MISUNDERSTOOD (MARCUS GUNN CASE)

Desislava Maslinkova[1], Svetla Staykova[2], Mihaela Hristova[3],Dora Simeonova[4], Harieta Manolova[5], Atanaska Avramova[6], Nadia Polnareva[7]

Ethical approval: Written consent was received from parents for the publication.
Conflict of interest and funding: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be considered as a potential conflict of interest.
Acknowledgement: We thank the patients' family for their participation and consent.
Author contribution statement: All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

Abstract: *Neurodevelopmental disorders emerge in early childhood, persist over time and are characterized by an atypical course of development together with permanent deviations in various areas of functioning. Marcus Gunn syndrome is a congenital disorder and few cases present comorbidity with a neurodevelopmental disorder. A case of a 34-month-old boy diagnosed with Marcus Gunn was admitted to a Child Psychiatry Clinic for a comprehensive multidisciplinary diagnostic evaluation because of controversy in previously received diagnosis. Issues such as comorbidity, classification systems, diagnosis pathway, its impact on the family and their readiness to receive help are introduced.*

Keywords: *Marcus Gunn, neurodevelopmental disorder, language disorder, autism.*

[1] **Dr. Desislava Maslinkova –** Senior Lecturer, PhD, MD. Medical University-Sofia. Clinic of Child Psychiatry "St. Nicholas", University Multiprofile Hospital for Active Treatment "Alexandrovska", Sofia, Bulgaria. desislavamaslinkova@gmail.com

[2] **Svetla Staykova –** Senior Lecturer, PhD. Department of Sensory Neurobiology, Bulgarian Academy of Sciences, Sofia, Bulgaria. svetla_petrova@gbg.bg

[3] **Mihaela Hristova –** Senior Lecturer, PhD, MD. Medical University-Sofia. Clinic of Child Psychiatry "St. Nicholas", University Multiprofile Hospital for Active Treatment "Alexandrovska", Sofia, Bulgaria. hristova.mihaela@gmail.com

[4] **Dr. Dora Simeonova –** Lecturer, MD. Medical University-Sofia. Clinic of Child Psychiatry "St. Nicholas". dora.simeonova@gmail.com

[5] **Harieta Manolova –** Assoc. Professor, PhD. Medical University-Sofia. Clinic of Child Psychiatry "St. Nicholas", University Multiprofile Hospital for Active Treatment "Alexandrovska", Sofia, Bulgaria. harieta.manolova@gmail.com

[6] **Dr. Atanaska Avramova –** Senior Lecturer, PhD, MD. Medical University-Sofia. Clinic of Child Psychiatry "St. Nicholas", University Multiprofile Hospital for Active Treatment "Alexandrovska", Sofia, Bulgaria. atanaska.avramova@gmail.com

[7] **Dr. Nadia Polnareva –** Professor, PhD, MD. Medical University-Sofia. Clinic of Child Psychiatry "St. Nicholas", University Multiprofile Hospital for Active Treatment "Alexandrovska", Sofia, Bulgaria. polnareva@gmail.com

Introduction

Diagnostics in early childhood is a challenge for every specialist, as very often the clinical picture fluctuates and there is an overlap between symptoms of different diagnostic categories, especially within the group of neurodevelopmental disorders. They emerge in early childhood, persist over time and are characterized by atypical development and permanent deviations in various areas of functioning (cognitive abilities and speech, communication and social relations, behavior and adaptive capacity). Pertaining to this group are the diagnoses assigned to the child in focus – Intellectual Disability (ID), Language disorder (LD), Autism Spectrum Disorder (ASD).

In general, the key symptoms of autistic disorder according to the Diagnostic and Statistical Manual of Mental Disorders, 5th ed. (DSM-5) and the International classification of diseases, 11th revision (ICD-10) are organized into two large groups: socio-communicative difficulties and stereotyped behaviors, which include also unusual responses to sensory stimuli (hypo/hypersensitivity) or unusual sensory interests in certain aspects of the environment [1] [2]. Although uncommon sensory sensitivity is frequent in autism, it is not a pathognomonic sign of the disorder [3], [4]. It exists as a separate category in the Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood (DC:0-5), and in the specific case we are reporting, it can also be regarded as a manifestation of the Marcus Gunn Jaw-Winking Syndrome (MGJWS) [5]. This syndrome is a relatively rare congenital disorder (to date, 300 cases of this syndrome have been reported in the medical literature), characterized by cranial dysinnervation [6]. It is expressed in synkinetic movements of one upper eyelid synchronized with jaw movement. People with this syndrome have varying degrees of blepharoptosis. By presenting this case, we would like to outline the necessity for clinical practice in early childhood to be approached with a willingness to integrate knowledge about early childhood development, and with consideration to the explanatory models used in traditional medical classifications (DSM-5 and ICD-10) and age-specific DC:0-5.

For the purposes of this presentation, we use the term "autistic disorder," referring to the ASD diagnostic category in DSM-5 and Childhood Autism diagnosis in ICD-10, as well as Language Disorder in the sense of the same according to DSM-5 and Expressive Language Disorder According to ICD-10. We also use "language disorder" as in DSM-5 and "expressive language disorder" as in ICD-10.

Case Description

S. is a 34-month-old boy who was admitted to the Child Psychiatry Clinic for the first time as part of a daily diagnostic program. The reasons for admission were the parents' concerns about the child's development and the various neurodevelopmental diagnoses assigned over a short period of time in an outpatient setting (a neurologist diagnosed the child with mental retardation at 30 months, and a child psychiatrist diagnosed him with ASD at 32 months).

S. is the first child in a mixed marriage family – a mother of Roma origin and a younger father of Bulgarian origin. This was a second marriage for the mother, who already had two older children (aged 24 and 22) and a 3-year-old granddaughter. The parents have secondary education, and only the father worked, while the mother was raising the child who didn't attend kindergarten. Only Bulgarian language is used in the family.

S. was born from a fourth pregnancy. It was a natural birth, nineteen days before due date. Birth weight was 2,900 g, with good cardiopulmonary adaptation. Discharged on the third day after birth. A problem-free neonatal period followed, although the boy was described by the parents as "*a very restless and crying baby*." The mother said that S. wanted to be carried mainly in her arms in a certain way. When he was placed in the crib or stroller, he began to cry. M: "*I was pushing the stroller empty and holding a young baby who couldn't even lift his head*."

S. was breastfed up to 32 months, in the last year mostly in the evenings, while falling asleep. Foods were introduced on time but, according to his mother, he experienced difficulties with chewing. Up to 24 months, he choked on larger pieces of cooked food and vomited. By the time of the evaluation, he was eating relatively diverse foods, could bite the food, but when the food contained products with different consistency, he ate it only crumbled. S. sat at 6 months and walked completely independently

at 14 months. He could ride a bike with auxiliary tires. When climbing stairs he could alternate legs, but when descending he failed to do so.

As a baby, S. actively cooed. M.: "*He sang and smiled at us all the time*." About the age of 12 months, S. had a distinct babbling speech. According to the mother and confirmed in a retrospective video, S. began to point with his index finger to an object of desire as early as 12 months. M.: "*He was looking at the ball and pointing at it. Then he would look at me and get angry if I didn't look at him*." S. understood and followed instructions. Up to the age of 30 months, he used only single words (mostly one-syllable, parts of a word) to communicate — addresses to relatives, animals, toys. The mother was worried about his speech development. She compared him to her granddaughter, who could connect two words in a sentence.

This was the reason why the child's GP referred the family to a child neurologist who diagnosed him with mental retardation and recommended speech therapy. The parents continued to worry and sought the opinion of a child psychiatrist, who diagnosed childhood autism after a one-time consultation. During this period, the mother tried to stop breastfeeding, to which the child reacted with general restlessness, disturbed sleep and appetite. M.: "*A lot has changed. From meek, calm and hugging, he became angry, constantly moving, crying and rejecting. He was angry with us all, but most of all with me. That's how he behaved then in the office. He didn't look at the doctor, he was crying and pulling me to the door*."

In the meantime, speech therapy began, where S. was initially restless, crying, looking for his mother, but adapted to the usual. He was already repeating more actively when required. He began to name objects in order to express his desire or impression more often, but it was not always clear what he was saying, as the words were incomplete. When he was not understood, he tried to explain with a gesture, e.g. pointed at his mouth when hungry. He used gestures to describe a toy he wanted.

During the diagnostic assessment, the parents were asked to describe in detail the child's development and functioning within a series of clinical interviews and questionnaires. Psychological and speech therapy assessments were also conducted. For the purposes of diagnostic clarification, available medical documents and home videos were reviewed, covering various events and situations in the child's life — from his birth to the time of the evaluation.

According to the parents, at this stage of development S. tried to dress and undress himself, but still needed help. M.: "*I did not leave him alone to do it. I've always been there for him*." The boy could eat with a spoon and drink from a glass. He would get irritated if soiled or wet. M.: "*He wants me to change his clothes right away and it's easier for me to feed him.*" By the time, they still used diapers, and the child reported his toilet needs only after they were done. M. "*I was afraid he would catch a cold and we didn't try*."

S. had been raised by the mother, to whom the child was attached and had good contact with. During the assessment, he looked for her, watched her reactions, sought her for sharing and help and included her spontaneously in play. S. liked to play with toy vehicles — cars, trains, etc. The game was functional, but the parents had noticed that he often observed objects with his peripheral vision, "*at an angle*." The boy did not like to touch sand, plasticine, and certain fabrics (plush). When asked about noise sensitivity, the mother replied that S. could not stand the noise of a vacuum cleaner and a hair dryer. Asked to explain the child's behavior in this situation, she described how S. was upset, came to her and wanted to be comforted.

Regarding communication with other children, the parents shared that S. communicated most often with the mother's granddaughter — they would chase each other and play games of daily living. F.: "*She speaks with complete sentences and understands much more, while he explains with gestures. He is constantly looking for her.*"

S. was in good physical health, rarely got sick. There were no data of hospitalization. When he was 10 months old, he was consulted by an ophthalmologist about a hordeolum of the upper left eyelid and chalazion in the same area and was diagnosed with Marcus-Gunn Syndrome in his left eye. The parents did not know the manifestations of the syndrome and did not take into account the possible consequences and complications. During the clinical assessment, a pediatric ophthalmologist was consulted, whose

conclusion confirmed the syndrome and assigned an additional diagnosis: Chalazion of the lower eyelid of the left eye, myopia and astigmatism, correction with glasses is forthcoming. Autorefractometry: DO + 0.50 / 30 °, LO + 1.0 / 180 °. There were no data on family history of somatic and mental disorders. Sessions aimed at diagnostic specification were conducted as part of the evaluation.

Child Psychological Assessment

Autism Diagnostic Interview-Revised (ADI-R) and Autism Diagnostic Observation Schedule (ADOS-2) are considered the gold standard in diagnosing ASD [7],[8]. We used them in order to exclude autistic spectrum disorder. ADI-R is one of the most widely used diagnostic algorithms and its administration requires a 90-minute session. It provides a thorough assessment of individuals suspected of having autism or other autism spectrum disorders. To administer the ADI-R, an experienced clinical interviewer questions a parent or caretaker who is familiar with the developmental history and current behavior of the individual being evaluated. The interview can be used to assess both children and adults, as long as their mental age is above 2 years, 0 months.

The ADI-R focuses on three functional domains:

• Language/Communication,
• Reciprocal Social Interactions,
• Restricted, Repetitive and Stereotyped Behaviors, and
• Interests.

S. did not receive elevated scores on any of the domains. The only points registered were within the domain "Restricted, Repetitive, and Stereotyped Patterns of Behavior" and in particular on item "Unusual Sensory Interests" in section C4: "Preoccupations with part of objects or non-functional elements of material." According to the applied diagnostic algorithm, all results were below the cutoff and therefore, there was no reason to make a diagnosis of autism. This conclusion was made after the application of ADI-R.

ADOS-2 is a semi-structured, standardized measure for assessment of communication, social interaction, and play that has significant clinical utility in identifying children on the autistic spectrum and determining the severity of the disorder. Taking into consideration the expressive language level ("Pre-Verbal/Single Words") and the chronological age of the child, Module 2 of the ADOS-2 was administered in accordance with the original guidelines. The sequence of 10 tasks was performed within one session. In a situation of free play S. engaged briefly in exploring the proposed stimuli — examined them and manipulated in accordance with their purpose. Soon after, he turned to the psychologist, looked at her and smiled. He pointed to one of the toys and named it, turned to the mother and did the same, then took another toy, went to the mother, pointed it out and gave the toy (afterwards this sequence was repeated spontaneously with the psychologist).

He responded when called by name — looked at the specialist, smiled and immediately looked for his mother. During the diagnostic sessions, many manifestations of social smile were registered, including in response to a joke, presented only through appropriate intonation or facial expression (recognized the intention and reacted in the expected way). The boy showed readiness for functional and symbolic imitation, and during a "birthday" theme play he spontaneously initiated the game, included the people present, distributed the cake and fed the dolls with it. Analysis of ADOS-2 scores revealed an overall total score on Module 2 standard algorithm of 2 points, which is below the ADOS-2 autism cut off and corresponds to "minimal to no evidence" of ASD. Clinical observations, along with other testing and information provided by parents supported these findings.

Detected deficits during the assessment were mainly in the field of expressive speech, while active use of nonverbal communication signals with compensatory function was registered. The child's understanding of instructions and messages was of relatively good quality and close to what is expected for his chronological age. By that stage, there was no evidence of a more global developmental delay.

Informed consent was received from parents for the publication.

Discussion

MGJWS was first described by the Scottish ophthalmologist Dr. Robert Marcus Gunn in 1883 as unilateral ptosis associated with contraction of the upper eyelid on the same side [9]. It is usually unilateral, more often on the left, but can also occur as bilateral [10], [11]. Coordinated synkinetic movements of the upper eyelid and jaw occur as a result of an abnormal connection between the motor branches of the n.trigeminus and a branch of the n. oculomotorius [11].The unusual neurological connection is thought to be due to the fact that the fibres of the fifth cranial nerve directly or indirectly innervate the eyelid-raising muscle. Familial cases of autosomal dominant inheritance have been described in the literature, but they are extremely rare [12]. There have been few reports of acquired MGJWS, which is thought to develop after complex eye surgeries and injuries [13]. Among people with congenital ptosis of the upper eyelid, the incidence of the syndrome is between 2 and 13% [14]. Although a baby is born with this syndrome, it can become visible and detected at a much later age. There is no gender distribution and men and women are equally affected [15]. Electromyographic studies show that the impulses for this synkinetic movement originate from the proprioceptive receptors of the external pterygoid muscle [16]. Eyelid contractions can be caused by chewing, sucking, lateral movement of the lower jaw, smiling, sticking out the tongue and even breathing. Synkinetic movement between the internal pterygoid muscle and the levator palpebrae superioris muscle has been documented in several patients. In such people, the eyelid is raised when closing the mouth and clenching the teeth [17]. There are no data in the literature on the causes of this phenomenon. One of the most common and widely accepted theories is that of an aberrant relationship, which can be: between cortical and subcortical branches; connections in the nucleus of the cranial nerve between the individual branches or "defective" distribution in the posterior longitudinal bundle; abnormal connections between the trigeminal and oculomotor cranial nerve; some trigeminal nerve fibers can reach the levator palpebrae superioris (LPS) [18].

Because MGJWS syndrome results from abnormal neural innervation rather than a primary muscular defect, histopathological examinations typically reveal normal morphology of the levator palpebrae superioris muscle[19].

In 50-60% of individuals there is strabismus, paralysis of the m. rectus superior bulbi, in 25% of individuals there is also paralysis of m.rectus superior and double elevator palsy in another 25% of cases [6].

According to another study, anisometropia was reported in 5 to 25% of patients with MGJWS and amblyopia in 30-60 % [20]. The authors of that study expressed the opinion that the cause of amblyopia may be secondary strabismus, anisometropia or occlusion of the ptotic eyelid. Rare ocular associations include Morning Glory abnormality or Duane syndrome [20]. MGJWS may also include cleft lip/palate, olfactory nerve disorders, CHARGE syndrome (coloboma, heart defects, choanal atresia, developmental and growth retardation, genital and ear abnormalities), and kidney stones [21].

Most often, this synkinetic movement of the eyelid is initially detected by the mother when breastfeeding or bottle-feeding the child. Ptosis can cause a child to lift his chin to see better, which occurs as a natural compensatory reaction.

The diagnosis is made on the basis of:

1. Unilateral eyelid ptosis.

2. The movement of the upper eyelid when opening the mouth, moving the jaw to the contralateral side, chewing, sucking, swallowing, clenching teeth, and pushing the jaw.

3. Hypotropia (vertical strabismus) may be present during cover test due to paralysis of the rectus superior [22].

For a detailed assessment of the condition, it is necessary to examine the eyelid-lifting muscle and directing the gaze from the bottom up, and then in the opposite direction and measure the position of the eyelids in the lower viewing position.

Ptosis can be classified as:

1. Light (up to 2 mm)
2. Moderate (3 mm)
3. Heavy (over 4mm) [23].

In the literature review, there are only two cases of comorbidity with neurodevelopmental disorder in children. The authors of the publication report two boys: a boy aged 7 with ADHD, without MR but in therapy for speech delay and a 10-year old boy with autistic disorder. Both cases have much more severe ophthalmic pathology [24]. So far, a case of such a young child with MGJWS has not been reported in terms of his mental development and how manifestations of the syndrome, when not recognized, can affect the diagnostic process. In the two cases mentioned above, this point of view is not discussed, and there is a lack of sufficient information about the development of the two young boys.

Conclusion

Diagnosing neurodevelopmental disorders is a responsible and complex process that involves assessment by a team of professionals (a child psychiatrist, a psychologist, and a speech therapist) who work in close collaboration with the family. One of the main elements in the diagnostic process is related to the collection of information about the child's development, their medical and educational history, which must be interpreted taking into account the influence of many factors (e.g. related to the parents, the child, the environment, etc.). This is especially important in early childhood and is in line with the principles of infant mental health [25]. Assessing the mental development and functioning of children between 0 and 5 years of age is recommended to take place within the context of relationships with the important people and therefore requires enough time and appropriate environment for their observation.

In the developmental history of S. a relatively typical course of development was registered, as the acquisition of age-appropriate skills and abilities occured with a certain delay — to some extent induced by the overprotective care of his parents. Speech problems were more distinct (especially in terms of expression) but the child began to compensate non-verbally.

This concise information corresponds to the way in which a child's difficulties can be conceptualized through the traditional medical classifications – DSM-5 and ICD-10. Based on the diagnostic criteria, S. falls into the category of Language Disorder and Expressive Language Disorder [1], [2]. The clinical picture does not meet the criteria for ASD. In the course of the assessment, sporadic manifestations of specific visual behaviors were registered, which could be erroneously defined as pertaining to the autistic disorder. For S., they could be considered as compensatory behaviors of ptosis associated with MGJWS aimed at improving visual perception, rather than as stereotyped patterns of behavior and in particular unusual sensory interests.

At the same time, in S.'s developmental history there were enough data directing towards a specific early childhood diagnosis according to DC:0-5 – Sensory Over-Responsivity Disorder [5]. Central feature is a persistent pattern of exaggerated, intense or prolonged responses to sensory stimuli that are more severe and frequent than are typically observed in children of similar age and developmental level. This pattern occurs in more than one context and involves one or more sensory domains. The parents provide information about unusual responses to various sensory stimuli, both in the past and present.

The sensory modalities that "unlock" the corresponding pattern of emotional and behavioral response are tactile, sound, vision, movement through space (vestibular sensation), sense of position of joints or pressure on muscles (proprioceptive sensation) and sensations from internal organs (interoception) [9]. S. was intolerant to certain fabrics and clothes; would become irritable when wet; would get upset to the sound of specific appliances and in infancy wanted to be carried in a specific position. By the time of the evaluation, S. would vomit when there were larger particles of food, although he could bite and chew.

This diagnosis appears only in the classification created for children from 0 to 5 years, which unfortunately is known and used by few specialists. Through this perspective, these aspects of S.'s behavior could be perceived as an important indicator of the need for early interventions to be provided in a timely manner.

Our experience with this case confirms the belief that working with very young children has its own specifics, thus requiring integration of knowledge about early childhood development, multidimensional and multiprofessional approach, as well as an appropriate classification system. Considering comorbidity (both psychiatric and somatic) is an important aspect of the diagnostic procedure. Looking

for specific symptoms in the child's behavior together with receiving confirmatory information from parents can lead to timely identification. The willingness of professionals working with young children to see the child beyond the diagnosis allows for a more accurate identification of the condition within the relevant medical categories. In this sense, relying on a classification that is specifically designed to serve the needs of infants and young children, would only be of use. A diagnosis, even when rejected, leaves its mark on the parents' vision of their child and influences their activities in seeking appropriate support.

REFERENCES:

1. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders* (5th ed.), 2013. https://doi.org/10.1176/appi.books.9780890425596
2. World Health Organization. ICD-11: International classification of diseases (11th revision), 2019. Retrieved from https://icd.who.int/
3. Unay OS, Doenyas C, Ekici B, Gonen I, Tatli B. Sensory problems in Turkish children with autism spectrum disorder. Çocuk Dergisi - *Journal of Child*, 2020;20(2):59-65, doi.org/10.26650/jchild.2020.2.773059
4. Kayihan H, Akel BS, Salar S, Huri M, Karahan S, Turker D, Korkem D. Development of a Turkish version of the sensory profile: translation, cross-cultural adaptation, and psychometric validation. *Perceptual and Motor Skills*. 2015 ;120(3):971-86. doi: 10.2466/08.27.PMS.120v17x8.
5. *Zero to Three. Diagnostic classification of mental health and developmental disorders of infancy and early childhood*: Revised edition (DC:0–5). Washington, DC: Author.
6. Bullock D. Marcus-Gunn jaw-winking ptosis: classification and surgical management. *Journal of Pediatric Ophthalmology and Strabismus*, 2016, 17(6):375–379. doi.org/10.3928/0191-3913-19801101-0624. Pratt SG, Beyer CK, Johnson CC. The Marcus Gunn phenomenon. A review of 71 cases. *Ophthalmology*, 198, 91(1):27-30.
7. Lord C, Rutter M, Le Couteur A: Autism Diagnostic Interview-Revised: a revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *J Autism Dev Disord* 1994, 24:659–685.
8. Lord C, Rutter M, DiLavore PC, Risi S, Gotham, K, & Bishop S. Autism Diagnostic Observation Schedule, Second Edition. Torrence, CA: Western Psychological Services, 2012.
9. Pratt SG, Beyer CK, Johnson CC. The Marcus Gunn phenomenon. A review of 71 cases. *Ophthalmology*, 1984;91(1):27-30.
10. Shah AD, Kumar AB, Kothari K. Bilateral Marcus Gunn jaw winking synkinesis with monocular elevation deficiency: a case report and literature review. *Int Ophthalmol*, 2012;32(2):199-201.
11. Weaver RG, Seaton AD, Jewett T. Bilateral Marcus Gunn (jaw-winking) phenomenon occurring with CHARGE association. *J Pediatr Ophthalmol Strabismus*, 1997;34(5):308-9.
12. Demirci H, Frueh BR, Nelson CC. Marcus Gunn jaw-winking synkinesis: clinical features and management. Ophthalmology, 2010;117(7):1447-52.
13. Kannaditharayil D, Geyer H, Hasson H, Herskovitz S. Bilateral Marcus Gunn jaw-winking syndrome. *Neurology*, 2015 ;84(10):1061.
14. Ziga N, Biscevic A, Pjano MA, Pidro A. Marcus Gunn Jaw-Winking Syndrome: A Case Report. *Med Arch*, 2019;73(4):282-284.
15. Khwarg SI, Tarbet KJ, Dortzbach RK, Lucarelli MJ. Management of moderate-to-severe Marcus-Gunn jaw-winking ptosis. *Ophthalmology*, 1999 ;106(6):1191-6.
16. Lehman AM, Dong CC, Harries AM, Patel A, Honey CR, Patel MS. Evidence of ancillary trigeminal innervation of levator palpebrae in the general population. *J Clin Neurosci*, 2014;21(2):301-4.
17. Su YH, Ong CT. Marcus Gunn jaw-winking syndrome. *Acta Neurol Taiwan*, 2010;19(1):76-7.
18. Freedman HL, Kushner BJ. Congenital ocular aberrant innervation--new concepts. *J Pediatr Ophthalmol Strabismus*, 1997;34(1):10-6.
19. D'Esposito M, Sanna G, Turra MV, CCaccia-Perugini G. Electromyographic study of the Marcus Gunn phenomenon]. *Bull Mem Soc Fr Ophtalmol*. 1970;83:177-87.
20. Alshamrani AA, Alghulaydhawi FA, Al Shamrani M. Marcus Gunn Jaw-Winking Syndrome Associated with Morning Glory Disc Anomaly. Middle East Afr J Ophthalmol, 2019;26(1):37-39.
21. Dżaman K, Zborowska-Piskadło K, Pietniczka-Załęska M, Kantor I. Marcus Gunn (jaw-winking) phenomenon in pediatric otorhinolaryngology practice. *Int J Pediatr Otorhinolaryngol*. 2019;117:153-156.

22. Awan KJ. Marcus gunn (jaw-winking) syndrome. Am J Ophthalmol. 1976;82(3):503-4.
23. Park DH, Choi WS, Yoon SH. Treatment of the jaw-winking syndrome. *Ann Plast Surg*. 2008 ;60(4):404-9.
24. Cordovez JA, Capasso J, Lingao MD, Sadagopan KA, Spaeth GL, Wasserman BN, Levin AV. Ocular manifestations of 22q11.2 microduplication. *Ophthalmology*, 2014;121(1):392-398. DOI: 10.1016/j.ophtha.2013.06.040
25. Shulman C. The Relational Context of Infant and Early Childhood Mental Health. In: *Research and Practice in Infant and Early Childhood Mental Health. Children's Well-Being: Indicators and Research*, vol 13. Springer, Cham., 2016, doi.org/10.1007/978-3-319-31181-4_6