AJPMHS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Pediatric Medicine and Health Sciences
Volume 01, Issue 03, 2023 ISSN (E): XXX-XXX

Modern Aspects of the Influence of Various Factors on the Formation and Development of the Craniofacial Region in Children With Hearing Impairment

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Summary: Journals, materials of scientific conferences, as well as other information sources were studied to collect reliable information on the impact of various factors on the development of the craniofacial region in children with hearing loss.

Keywords: craniofacial region, hearing loss, early postnatal ontogenesis, various factors

Purpose of the study: to study the impact of various factors on the development of the craniofacial region in children with hearing loss.

Materials and methods. Information sources devoted to changes in the craniofacial region in children with hearing loss and materials related to the study of the impact of various factors were used.

Results and discussion.

Today, according to the World Health Organization (WHO), hearing loss is one of the leading factors that can worsen a person's lifestyle. 5.3% of the world's population is hearing impaired (WHO, 2012). One in 1,000 newborns is born with grade 3 or 4 sensorineural hearing loss. According to the Ministry of Emergency Situations, the number of children with severe hearing impairment and deafness who applied in Uzbekistan in 2014 was 520, this figure was 2000 due to the introduction of a modern diagnostic method - audio screening [1,5].

According to statistics (2021) from the United Nations (UN), more than 5% of the world's population, or 430 million people, need rehabilitation to address "disabling" hearing loss (432 million adults and 34 million children). It is estimated that by 2050 more than 700 million people, or one in ten, will have disabling hearing loss [8].

"Disabling" is defined as hearing loss in the better ear that exceeds 35 decibels (dB). Nearly 80% of these people live in low- and middle-income countries. Hearing loss is more common among older people: more than 25% of people over the age of 60 years suffer from this problem [7,12].

A person who cannot hear as well as a person with normal hearing—threshold of hearing 20 dB or lower in both ears—suffers from hearing loss. Hearing loss can be mild, moderate, severe, or profound. It can develop in one or both ears and make it difficult to hear spoken language or loud sounds [6,10].

The concept of "hearing loss" applies to people with hearing loss ranging from mild to severe. Typically, people with hearing loss communicate using spoken language and can use

hearing aids, cochlear implants and other assistive devices, as well as subtitles to improve hearing [2,9].

“Deaf” people in most cases suffer from profound hearing loss, that is, they hear very poorly or not hear at all. These people often use sign language to communicate.

It has been established that in children with deafness or hearing loss in more than 80% of cases, the disease is first diagnosed at the age of less than one year. In half of them, the disease is congenital or hereditary, that is, it appears as a result of the pathology of pregnancy, childbirth, or is transmitted genetically [3,4].

Describing the characteristic features of hearing loss in childhood, otolaryngologists distinguish several groups of patients. The basis is the time of onset of deafness. This is due to the fact that the cortex of the temporal lobes - the final section of the auditory analyzer - develops in a "sounding" environment. Even if parts of the brain are damaged, the child has a chance to keep hearing: the neurons surrounding the pathological focus form new connections and take on the functions of the dead. This is the phenomenon of neuroplasticity.

There are several options for hearing loss in babies: a deaf-mute child; hearing-impaired child; late deaf child.

A deaf-mute child had a persistent, bilateral hearing impairment that arose before the formation of speech. He does not understand the addressed speech and seeks to establish communication through facial expressions, gestures, manipulations with objects.

Late deaf children lose their hearing after some kind of illness or taking ototoxic drugs. Even if hearing loss occurs after the formation of speech, the lack of rehabilitation measures at preschool age leads to intellectual decline. Over time, these children become depleted in vocabulary, pronunciation becomes incorrect. With a decrease, hearing loss at a later age, the prognosis is more favorable, but pronunciation suffers to one degree or another: articulation, intonation are disturbed, errors in stress occur, speech becomes slurred [9,13].

A hearing-impaired child perceives sounds, but the degree of impairment varies. At the debut of the disease up to 1 year, speech development suffers: the cooing gradually disappears, the baby switches to sign language. Speech acquisition is almost impossible. Signs of a later hearing loss are: poor vocabulary, word distortion, violation of the grammatical structure of the sentence, "blurred", fuzzy speech.

Early diagnosis of hearing loss in young children will allow you to start rehabilitation measures on time, not to miss the optimal time for installing a cochlear implant or reconstructive surgery.

Hearing loss can be first diagnosed at any age. Refusal of medical care leads to a worsening of the condition. Adult patients may lose their jobs or gradually lose self-care skills. Hearing loss in children often leads to speech disorders and developmental delays, in particular in the craniofacial region [11].

The craniofacial complex includes the head, face, and oral cavity and is the most distinctive of all human body structures, giving individuals unique features. Structures of the craniofacial complex such as the mandible, palate, temporomandibular joint (TMJ) and dentition offer valuable paradigms for studying development, structure, and function [5,10].

Craniofacial deafness syndrome is characterized by characteristic facial features and profound hearing loss [1,4].

The distinctive facial features of people with craniofacial deafness syndrome are the result of various anomalies in the development of the skull and face. Deaf children often have underdeveloped or absent nasal bones, resulting in a small nose, thin nostrils, and a flattened

midface with a flat bridge of the nose. People with this disorder usually also have widely spaced eyes (ocular hypertelorism), constricted eye openings (narrowed palpebral fissures), a small upper jaw (maxillary hypoplasia), and a small mouth with pursed lips.

People with this condition also have profound hearing loss, which is caused by an abnormality in the inner ear (sensory deafness). Hearing loss in these people is present from birth [7,8].

Conclusion. The pathology of even a part of the sensory system, in this case hearing, leads to a disruption in the processes of perception and assimilation of information, a slowdown in the formation of conditioned reflex connections necessary in the process of motor activity, including a number of motor manifestations that do not require direct participation of the auditory analyzer.

Damage to the auditory analyzer primarily affects the work of the vestibular and kinesthetic analyzers, which entails a delay in the formation of the upright function, impaired muscle tone and the ability to maintain balance, underdevelopment of the ability to orientate in space, difficulties in differentiating motor sensations and performing complex-coordinated movements, in insufficient development of clear, smooth and measured movements.

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