ОТОЛАРИНГОЛОГИЯ OTOLARYNGOLOGY

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ASSESSMENT OF RISK FACTORS FOR SENSORINEURAL HEARING LOSS

The identification of the hearing loss causes is the main stage on the way of solving problems related to the search for effective methods of inner ear diseases treatment. Sensorineural hearing loss is a complex multifactorial disease with unexplained pathogenesis. The development of hearing pathology is influenced by various causes. It has been established that the causes include violations in the antenatal - prenatal period (marriage between close relatives, rubella, syphilis, metabolic disorders), perinatal period (birth trauma - anoxia, jaundice (hemolytic), neonatal - postnatal period (otitis media, infectious diseases (meningitis, measles, parotitis), trauma of the cervical spine and head).
Keywords: sensorineural hearing loss,deafness, risk factors.

Relevance. The identification of the hearing loss causes is the main stage on the way of solving problems related to the search for effective methods of inner ear diseases treatment. Whereas, genetic disorders were deemed to be the cause of 60% of all congenital and early pediatric hearing loss cases.[1; 2].

In 2005, R. Smith published an article, which contains the diagram demonstrating data on syndromic and nonsyndromic forms of hearing loss according to its share in the general group of congenital and prelingual pediatric hearing loss cases [7].

According to the proposed scheme in the article,created by R. Smith and Guy Van Camp, 50% of all congenital and prelingual hearing loss has an acquired character. The rest cases occur due to genetic changes. Hereditary hearing loss include up to 30% syndromic forms and 70% of nonsyndromic forms of hearing impairments. It is believed that the latter include 75% -85% autosomal recessive forms, 15% -24% autosomal dominant forms, 1-2% X-linked recessive forms, and 1% was associated with mitochondrial DNA mutations. Autosomal recessive nonsyndromic hearing loss forms in 50% of cases are linked with the DFNB1 locus (Cx26 and Cx30 genes). Thus, the Cx26 gene mutation amounts not less than 16% of all prelingual SNHL cases. The remaining 50% are associated with the other recessive loci [7;5].

The development of hearing pathology is influenced by various causes. It has been established that the causes include violations in the antenatal - prenatal period (marriage between close relatives, rubella, syphilis, metabolic disorders), perinatal period (birth trauma - anoxia, jaundice (hemolytic), neonatal - postnatal period (otitis media, infectious diseases (meningitis, measles, parotitis), trauma of the cervical spine and head).(Yu.V. Kozyun, G.A. Tavartkiladze).

Review. According to various authors, the acquired hearing loss in children most commonly occurs as a result of prenatal infections such as toxoplasmosis, rubella, cytomegalovirus, and herpes. In this regard, in recent years there has been a significant increase in interest in the problem of prenatal infections, among which a special attention has been paid to herpesvirus infections and, in particular, cytomegalovirus infection. Herpes and cytomegalovirus infections remain one of the leading causes of stillbirth, spontaneous miscarriages, premature births, neonatal morbidity and infant mortality. According to the data of domestic and foreign specialists, from 0.5 to 5% of children are born with congenital CMV (cytomegalovirus) infection, about 90% of which of are asymptomatic carriers children [8;11]. At the same time, the subclinical form of CMV infection does not mean a guarantee of well-being, violations of central nervous system, hearing, vision, cerebral palsy, mental retardation, poor school performance are diagnosed in 5-15% of such children in the next 1-2 years and later [9;10].And also high incidence of Down's disease is associated with congenital CMV infection [11]. Many surviving children have long-term and sometimes lifelong complications: 28% have a mental retardation, 58% have neuromuscular disorders, including cerebral palsy, as well as somatosensory insufficiency, 20% have hearing loss, 24% have visual impairment [11]. All this led the European Regional Bureau of the World Health Organization to the decision to include CMVI (cytomegalovirus infection) in a group of diseases that determine the future of infectious pathology in 1984 [11]. In addition, WHO included CMVI in intrauterine infectious disease syndrome called TORCH syndrome, which includes T-toxoplasmosis, O-syphilis, listeriosis and other infections, R-rubella, C-cytomegalovirus infection and chlamydia, H-herpes and hepatitis [11].

According to the large-scale study conducted by the researchers of the Research Institute of Obstetrics and Gynecology of the Republic of Kazakhstan, primary CMV infection was detected in 31.2% of women with threatened miscarriage, in 18.2% of women with a spontaneous abortion, in 39.5% of women with premature birth, at 53.4% of women with polyhydramnios, in 35,4% of women with missed miscarriage [11].

And also premature birth, low body weight, child asphyxia refer to important exogenous risk factors.

In the total population of newborns, the share of premature infants is becoming more and more significant and amounts to 5-10% of newborns [19]. According to studies conducted in France and the United States, the incidence of severe hearing impairment in the group of newborns with a body weight of less than 2000g is 15.5 per 1000, and in the group of small premature infants it is 4-5% [20]. In recent years, the importance of perinatal pathology has significantly increased as one of the causes of congenital hearing loss and deafness in children [6,3]. In addition, it is known that this pathology develops in the first year of life in 82% of children with hearing loss and deafness, and in 38.5% of them - in the perinatal and neonatal period [21].

Postnatal infections, in particular, bacterial meningitis caused by Neisseria meningitidis, Haemophilusinfluenzae, Streptococcus pneumoniae, are often complicated by total hearing loss, vestibular disorder [5].

According to the World Health Organization, around 1 million cases of bacterial purulent meningitis are registered worldwide annually, 200 thousand cases of which are fatal cases [4,12,13]. Meningitis is one of the most frequent clinical forms in the structure of the general pathology of the nervous system [13; 17].

In the Republic of Kazakhstan, meningococcal infection is more often diagnosed in children. According to official statistics of the Republic of Kazakhstan, the highest incidence rate was registered in Almaty city (1.58 per 100 thousand people in 2012) and in Astana city (1.38 per 100 thousand people in 2012) [18].

The patients were mostly children under the age of 5, with the highest incidence rate in children under 1 year old. In general, if we speak about all purulent bacterial meningitis cases, then there is no tendency to reduce the incidence rate for the period 2009-2013. Meningococcal meningitis (32%) prevailed in the etiologic structure of the children's population of Almaty (1993-2007) and unfortunately a percentage of meningitis of unknown etiology was remaining high (39,8 %) [18].

There is a high mortality rate in purulent meningitis, reaching an average of 4-10%, which is due to the severity of the course and numerous complications of the disease. They include: toxic shock syndrome (TSS), hypertension-hydrocephalic syndrome (HHS), sensorineural hearing loss syndrome, development of paresis and paralysis, apallic syndrome. Persistent organic lesions of the central nervous system (CNS) in the residual period are observed in almost 1/3 of the children who have recovered from the disease [16, 14, 15, 13].

Conclusion. Numerous studies indicate a significant contribution of genetic factors in violations of auditory perception. The

absence of data on cases of hearing impairment among family members does not exclude the possibility of the genetic origin of hearing loss, but one can also expect the acquired character of the lesion in a child from deaf parents. The problem of hearing loss is still relevant in the medical and social terms, as it often leads not only to a significant life quality deterioration, but also causes disablement in a number of patients.

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СЕНСОНЕВРАЛЬДІ КЕРЕҢДІКТІҢ ДАМУЫНДАҒЫ ҚАУІПФАКТОРЛАРЫН БАҒАЛАУ

Түйін: Кереңдіктің себебін анықтау ішкі құлақ ауруларын емдеудеу мәселесінде тиімді әдістерді таңдау жолындағы негізгі деңгейі болып табылады.Сенсоневральді кереңдік патогенезі толық зерттелмеген полиэтиологиялық ауру болып табылады. Бұл себептер антенатальді- босануға дейінгі (туыстар арасындағы неке, қызамық, мерез, метоболикалық бұзылыстар), перинатальді – босану кезеңі (туыт жарақаттары- анорексия, гемолитикалық сарғаю), неонатальді – босанудан кейінгі (ортаңғы отит, жұқпалы аурулар(менингит, корь, эпидемиялық паротит), бассүйек пен омыртқаның мойын аймағының зақымдануы) кезеңдерде есту қабілетінің бұзылыстарыныңдамуына септігін тигізеді.
Түйінді сөздер: сенсоневральді кереңдік, кереңдік, қауіп факторлары.

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ОЦЕНКА ФАКТОРОВ РИСКА РАЗВИТИЯ СЕНСОНЕВРАЛЬНОЙ ТУГОУХОСТИ

Резюме: Выяснение причину тугоухости является главным этапом на пути решения проблем, связанных с поиском эффективных методов лечения заболеваний внутреннего уха.*Сенсоневральная тугоухость является* сложным *полиэтиологичным заболеванием* с неизученным до конца патогенезом. Установлено, что причины включают в себя нарушения в антенатальном - дородовом (брак между близкими родственниками, краснуха, сифилис, метаболические нарушения), перинатальном - родовом (родовая травма – аноксия, желтуха (гемолитическая), неонатальном - послеродовом (средний отит, инфекционные болезни (менингит, корь, паротит), травма шейного отдела позвоночника и головы) периодах.
Ключевые слова: сенсоневральная тугоухость, глухота, факторы риска.