

HEARING LOSS IN CHILDREN: CAUSES, EARLY DETECTION, AND PREVENTIVE MEASURES

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Introduction: Hearing loss in children is one of the most prevalent sensory disorders worldwide and represents a critical public health concern due to its profound impact on speech, language, cognitive, and social development. Early childhood is a vital period for the acquisition of communication skills; therefore, undiagnosed or untreated hearing impairment can result in long-term educational and psychological challenges. According to the World Health Organization, over 34 million children globally live with disabling hearing loss, and many of these cases are preventable through timely detection and proper management. The etiology of pediatric hearing loss is multifactorial, encompassing genetic factors, prenatal and perinatal complications, infectious diseases, ototoxic medications, and environmental noise exposure. In many developing countries, including Uzbekistan, limited access to neonatal screening and audiological services leads to delayed diagnosis, which exacerbates developmental delays and social integration difficulties. This study aims to analyze the major causes of childhood hearing loss, evaluate the effectiveness of early detection programs, and propose preventive strategies to minimize its occurrence and consequences.

Objective: The primary objective of this study is to determine the leading causes of hearing loss among children in the Samarkand region, assess the current state of early detection programs, and identify preventive and interventional measures that can reduce the incidence and long-term impact of pediatric hearing impairment.

Materials and Methods: A descriptive cross-sectional study was conducted involving 200 children aged between 0 and 10 years who attended the otorhinolaryngology and pediatric departments of Samarkand State Medical University Hospital during 2022–2024. All participants underwent detailed otoscopic examination, pure-tone audiometry, tympanometry, and otoacoustic emission (OAE) testing. Data on prenatal and perinatal history, family medical background, exposure to ototoxic drugs, previous infections such as otitis media, measles, or meningitis, and noise exposure were collected through structured parental interviews and medical records. Statistical analysis was performed using SPSS software to determine the correlation between etiological factors and the degree of hearing impairment. Ethical approval was obtained from the university's review board, and informed consent was collected from parents or guardians.

Results: Among the 200 examined children, 38% were diagnosed with sensorineural hearing loss, 44% with conductive hearing loss, and 18% with mixed types. The leading causes included chronic otitis media (29%), congenital or genetic disorders (22%), perinatal hypoxia (14%), and post-infectious sequelae of meningitis and measles (12%). Exposure to ototoxic drugs accounted for 7% of cases, while environmental noise exposure contributed to 5%. Only 31% of children had undergone hearing screening before the age of 6 months, highlighting the insufficiency of early detection programs. Early diagnosis within the first year of life was strongly correlated with better speech development outcomes and reduced educational delay. Children

diagnosed after the age of two exhibited markedly poorer communication abilities and social interaction skills.

Discussion: The findings confirm that preventable and treatable causes such as otitis media, infections, and perinatal complications remain major contributors to childhood hearing loss in the Samarkand region. The low rate of neonatal screening indicates a critical gap in early identification and intervention. Universal newborn hearing screening (UNHS), combined with regular pediatric auditory monitoring, could significantly reduce the prevalence of permanent hearing impairment. Genetic counseling and public health education for parents, particularly regarding ototoxic drug use and prenatal care, are essential preventive strategies. Furthermore, integration of otolaryngological assessment into routine pediatric checkups and the expansion of school-based hearing programs would allow earlier detection of mild or progressive forms of hearing loss that often remain unnoticed until they cause learning difficulties. Strengthening collaboration between pediatricians, audiologists, and educators is crucial for ensuring timely diagnosis and rehabilitation.

Conclusion: Hearing loss in children is a multifactorial condition with profound developmental and social consequences if left undiagnosed or untreated. The study demonstrates that chronic middle ear infections, perinatal hypoxia, and genetic disorders are the most frequent etiologies, with a significant proportion of cases being preventable. Early detection through universal neonatal screening, improved access to audiological services, and parental education are vital to reducing the incidence and impact of hearing impairment in childhood. Establishing a national screening program, enhancing primary healthcare awareness, and promoting early rehabilitative interventions such as hearing aids and cochlear implants can dramatically improve quality of life and developmental outcomes for affected children. Strengthening preventive measures and health education will ultimately decrease the burden of childhood hearing loss in Uzbekistan and contribute to healthier, more communicative generations.

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