Acquired Hearing Loss in Children

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KEYWORDS

• Cytomegalovirus (CMV) • Toxoplasmosis • Meningitis • Rubella • Syphilis • Noise • Enlarged vestibular aqueduct • Sudden sensorineural hearing loss

KEY POINTS

- Hearing loss is the most common congenital sensory impairment, with an incidence of 4/1000 live births. This number rises to approximately 20% after the age of 12 years for all degrees and laterality of hearing loss.
- The World Health Organization (WHO) notes that 50% of hearing loss is due to preventable causes. These include preventable viruses, such as rubella and cytomegalovirus (CMV); low birth weight and other prenatal, perinatal, and postnatal complications; head injury; ototoxicity; and noise.
- Congenital CMV is the most common viral cause of congenital hearing loss. Early postnatal identification of CMV can identify those who may benefit from medical treatment.
- Hearing loss due to noise is increasingly common but preventable.
- Head injuries, including concussion, can lead to both hearing loss and vestibular dysfunction.

INTRODUCTION

Hearing loss is the most common congenital sensory impairment. Bilateral severe to profound hearing loss is present in 1 to 2/1000 live births, and if unilateral and mild to moderate hearing losses are included, the number rises to 4/1000. According to National Health and Nutrition Examination Survey data from 2001 to 2008, 20.3% of all subjects aged greater than to equal to 12 had a unilateral or bilateral hearing loss, with many of these hearing losses acquired and of later onset.[1] Furthermore, the prevalence of hearing loss increased with every decade, was less prevalent in women compared with men, and in white individuals versus black across nearly all decades. The WHO notes that, worldwide, there are 360 million people with disabling hearing loss and that 50% is preventable.[2] The purpose of pediatric hearing evaluation is to

Disclosures: None relevant.
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Otolaryngol Clin N Am 48 (2015) 933–953
http://dx.doi.org/10.1016/j.otc.2015.07.011 **oto.theclinics.com**
0030-6665/15/$ – see front matter

Abbreviations

AIED	Autoimmune inner ear disease
BOR	Branchio-oto-renal syndrome
CDC	Centers for Disease Control and Prevention
CHARGE	Coloboma, heart defect, atresia choanae (ie, choanal atresia), retarded growth and development, genital abnormality, and ear abnormality
CMV	Cytomegalovirus
CRS	Congenital rubella syndrome
CS	Congenital syphilis
ECMO	Extracorporeal membrane oxygenation
EVA	Enlarged vestibular aqueduct
FTA	Fluorescent treponemal antibody absorption test for syphilis
HSV	Herpes simplex virus
HZO	Herpes zoster oticus
NICU	Neonatal intensive care unit
OAE	Otoacoustic emission
OM	Otitis media
PCR	Polymerase chain reaction
PDS	Pendred syndrome
SNHL	Sensorineural hearing loss
TORCHES	Toxoplasmosis, other infections, rubella, cytomegalovirus, herpesvirus, and syphilis
VLBW	Very low birth weight
WHO	World Health Organization

identify the degree and type of hearing loss and the etiology and to outline a comprehensive strategy that supports language and social development and communication. This article reviews the causes and evaluation of acquired and later-onset hearing loss.

NEWBORN HEARING SCREENING

Most newborn hearing screening uses either automated auditory brainstem response testing and/or otoacoustic emissions (OAEs) in the 30-dB to 35-dB range. It is, therefore, entirely possible to pass a newborn hearing screen and have a mild degree of hearing loss. Many infants who pass a newborn hearing screen may subsequently fail a hearing screen in preschool or in the early elementary grades. Although these children may have a progressive or acquired hearing loss, the hearing loss may also just be a more accurate evaluation of a preexisting congenital hearing loss. In addition, newborn hearing screening programs using only OAEs may miss auditory dyssynchrony.[3] Therefore, even if an infant or young child has passed a newborn hearing screen, if hearing loss is suspected, and/or speech and language are delayed, a more complete diagnostic audiometric examination is always warranted.

OVERVIEW OF CAUSES OF HEARING LOSS IN INFANTS AND CHILDREN

Identifying the cause of the hearing loss can provide prognostic and educational information to the family and help support a plan for (re)habilitation. Careful evaluation can now pinpoint a definite or probable cause of the hearing loss 50% to 60% of the time. The etiologies of hearing loss have often been divided into congenital and acquired. Many of the causes that are congenital, however, were “acquired” in utero and may only present at a later time (eg, delayed onset of sensorineural hearing loss [SNHL] from CMV); this is in contrast to those truly acquired after birth (eg, secondary to