



No association between hearing loss due to bilateral otitis media with effusion and Denver-II test results in preschool children[☆]

Bulent Serbetcioglu^{*}, Ozgur Ugurtay, Gunay Kirkim¹, Basak Mutlu

Dokuz Eylul Medical School, Department of Otolaryngology, Inciralti-Izmir 35340, Turkey

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Transient otoacoustic emissions

Summary

Objective: Otitis media with effusion (OME) is the most common cause of acquired hearing loss in childhood and has been associated with delayed language development and behavioral problems. In this study, children with an evidently recurrent otitis media were investigated. The present study examines the association between hearing loss versus developmental screening test parameters of preschool children.

Methods: Sixteen children with bilateral otitis media were compared with age-matched same number of children with normal hearing (controls).

Results: Language and verbal cognitive abilities were not affected significantly as a result of the presence of hearing loss because of OME. Using internationally standardized Denver-II test to evaluate the language development and other developmental screening parameters, no significant difference was found between the patient and control groups.

Conclusions: This study failed to find any association between the hearing loss due to otitis media with effusion and speech and language parameters in preschool children.

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1. Introduction

Otitis media with effusion (OME) is one of the most common clinical conditions of young children [1,2]. Otitis media with effusion is most prevalent in children below 6 years [3]. The majority of children with OME experience spontaneous reabsorption of the middle-ear fluid in less than 6 months [4]; however, some continue to develop persistent OME. It is often asymptomatic or is revealed by a

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^{*} Corresponding author. Tel.: +90 232 4123255; fax: +90 232 4123269.

E-mail addresses: serbetcioglu@gmail.com (B. Serbetcioglu), gunay.kirkim@deu.edu.tr (G. Kirkim).

¹ Tel.: +90 232 4123292; fax: +90 232 4123269.

hearing loss, delaying language development or causing behavior troubles or balance problems [5]. In otherwise healthy children who have had persistent middle-ear effusion (MEE) for at least 12 months, during their first 3–6 years of life, they may prone to delay in language acquisition as well as in motor–mental development. A body of evidence has established a link between persistent middle-ear pathology and hearing loss, speech, and language impairments [1,6]. A main reason for concern in infants and young children is the possibility that the condition, if OME has been persistent enough in early life, may adversely affect children's language, speech, or cognitive development later in life, even after OME has resolved and hearing has returned to normal [7]. The conductive hearing impairment that accompanies episodes of middle-ear effusion has been suggested as the reason for some reports of children's delay in language acquisition [e.g., 2,8]. However, Shekelle et al. concluded that there was no evidence to support the concern that OME during the first 3 years of life related to later receptive or expressive language [9]. Thus, despite the high prevalence of OME with associated conductive hearing loss, there remains a controversial data concerning the effects of OME on language and motor skills. In other words, the literature survey on this topic demonstrated that numerous studies have examined the effects of otitis media with effusion on young children, particularly from a language development perspective [10]. However, to date, the results of this kind of research have been inconclusive [2]. Not only for children who are native English speakers, but also for other languages, extensive research is needed to identify and describe the sequelae of otitis media, particularly in preschool children, whose language acquisition depends on their hearing levels [2].

For preschool children, the Denver developmental screening test II can be used to screen general development, including speech and language [11]. The Denver test is one of the oldest and best known internationally standardized developmental growth chart, and is utilized to estimate the developmental age values of each individual. Originally, Denver test is not designed as a growth chart, although it measures like a growth chart. This standardized tool is designed to be used with children between birth and 6 years of age to assess performance on various age-appropriate tasks. Better to call it a screening measure to provide an overview of the child's strengths and weaknesses. This test was restandardized and revised for various populations (i.e. Denver-II test) [11]. It includes a set of questions for parents and tests for the child on 20 simple tasks and items that fall into four categories: language (39

items), fine motor adaptive (29 items), gross motor (32 items), and personal–social (25 items). The number of items administered during an assessment varies with the child's age and ability.

The present investigation examined the effects of conductive hearing loss caused by OME on language and motor skills in preschool children. Thus, the purpose of this study was to investigate whether children with OME differ from those of age-matched peers without OME, when tested with the Denver-II test. These two groups were also tested using subjective as well as objective audiological tests. For the audiological evaluation, pure tone audiometry, acoustic admittance and click-evoked otoacoustic emission testing were performed for the present study. Tympanograms of all patients were Type B exclusively, whereas all the subjects of the control group were recorded as having Type A tympanogram only.

2. Methods

2.1. Study group

In the study group, 16 patients with bilateral OME were recruited for participation. Seven patients were male and nine were female. Subjects for the study group were recruited from Outpatient Clinic of University Hospital, Department of Otolaryngology, who were diagnosed as having bilateral OME. The children in the study group met the same health criteria as the control group (see following paragraphs) as well as the additional criteria of history of bilateral persistent OME present at the time of the pretest as determined by otoscopy and impedance testing. All these children were products of a full-term gestation. Informed consent was obtained from all the participants' parents. Otoscopy and impedance testing were performed at 3-month intervals to check the presence of effusion in both ears of the children. Of the children with OME, only those resistant to medical treatment were included in the study. Totally, 15 children were excluded from the study group, either due to resolution of the effusion or because parents opted for surgical treatment.

The following are the inclusion criteria for study group:

- (1) bilaterally confirmed OME (otoscopy/tympanometry/acoustic reflex);
- (2) nonsurgically treated patients, resistant to medical treatment;
- (3) the period of OME was at least 12 months;
- (4) children in the age range of 40–75 months;

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