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Early middle ear effusion and language at age seven

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Abstract

This study examined the relation of middle ear effusion (MEE) in the first 3 years of life to language outcomes at age seven. It was hypothesized, on the basis of a literature review, that (1) a low, but positive relation between early MEE and language measures in general will be observed at age seven, and (2) major effects will be demonstrated for measures of articulation and phonological sensitivity. MEE was assessed as days with bilateral MEE and episodes of MEE. Three measures of language status were used: the Test of Auditory Analysis Skill (TAAS [Rosner, J. (1975). *TAAS: Test of Auditory Analysis Skill*. Novato, CA: Academic Therapy Publications]), Goldman-Fristoe Articulation Test, Sounds in Words and Sounds in Sentences (GFAT [Goldman, R., & Fristoe, M. (1986). *Goldman-Fristoe Test of Articulation*. Circle Pines, MN: American Guidance Service]), and the Clinical Evaluation of Language Fundamentals-revised (CELF-R [Semel, E. M., Wiig, E. H., & Secord, W. (1987). *CELF: Clinical Evaluation of Language Fundamentals-Revised*. New York: Harcourt Brace Jovanovich]). The sample included 179 children who were heterogeneous for SES and ethnicity. There were no significant correlations for MEE and language measures. These negative results were sustained when multiple regression was used with controls for socioeconomic status and quality of the home environment.

Learning outcomes: We conclude that early MEE may not pose a threat to language development in the early school years.

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Middle ear effusion (MEE) is a common illness of infancy and early childhood and a common cause of temporary hearing loss. Although in the great majority of cases the hearing loss is transitory, it may still have an enduring effect on language development. Several research studies report that certain aspects of language development are affected (Casby, 2001; Roberts, Rosenfeld, & Zeisel, 2004). These meta-analyses included studies of children who were 5 years of age or younger.

Several prospective studies that have followed children from infancy or early childhood into the elementary school years have reported mixed findings. Five found some evidence of adverse consequences of early MEE. Silva, Chalmers, and Stewart (1986) reported lower scores for the MEE group on speech articulation and verbal expression, but not verbal comprehension at age seven. Bennett and Haggard (1999) showed a low, but significant, correlation between early MEE and more limited receptive vocabulary at age 10 years, but no significant relations for other aspects of language at that age. Reporting similar results, Teele, Klein, Chase, Menyuk, and Rosner (1990) found MEE in the first 3 years was related to Goldman-Fristoe articulation and morphological markers at age seven, but seven other tests of language yielded non-significant results. Schilder, Snik Ad, Straatman, and van den Broek (1994) found that in a very persistent MEE group, MEE was related to impaired perception of speech in sound. This group was documented to have MEE during preschool and thereafter. The only speech and language abnormality reported was a possible effect on speech-in-noise. In a study conducted by Feagans, Sanyal, Henderson, Collier, and Applebaum (1987), MEE predicted poorer narrative skills at age seven, but had no relation to mean length of utterance.

On the contrary, four studies found no relation between early MEE and later language measures (Paradise et al., 2005; Roberts, Burchinal, & Zeisel, 2002; Harsten, Nettelblatt, Schalen, Kalm, & Prellner, 1993; Grievink, Peters, van Bon, & Schilder, 1993; Peters, Grevink, van Bon, van den Bercken, & Schilder, 1997). Examination of these reports yields few clear explanations of why some researchers have obtained significant relations between early MEE and later language measures. Two possible clues are that more evidence of long-term MEE effects was found in studies of the presence of MEE as late as age 5 years (Silva et al., 1986; Bennett & Haggard, 1999) and those that assessed articulation problems (Silva et al., 1986; Teele et al., 1990).

Our previous research showed significant, but small, relations between early MEE and language measures at age 5 years (McCormick, Baldwin, Klecan-Aker, Swank, & Johnson, 2001). These effects were found with the Carrow Elicited Language Inventory (CELI, Carrow, 1974) and the Goldman-Fristoe Articulation Test (GFAT, Goldman & Fristoe, 1986). The CELI tests phonological sensitivity and the GFAT measures errors in articulation. However, we did not find significant relations with scores on the Carrow Auditory Visual Abilities Test (CAVAT, Carrow-Woolfolk, 1981) except for speech discrimination in quiet (McCormick et al., 2001). Other CAVAT scales (17 in all), and the Test for Auditory Comprehension of Language-Revised (TACL-R, Carrow-Woolfolk, 1985) produced no significant relations. Given the mixed results obtained by our group and others it seemed prudent to make two hypotheses about the relation of early MEE measures of language at age seven: (1) a low, but positive relation between early MEE and language measures in general will be observed at age seven, and (2) major effects will be demonstrated for measures of articulation and phonological sensitivity.

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