



Otitis Media And Early Development In A High Risk Pediatric Population

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Background

- Otitis media is the most common pediatric diagnosis of early childhood other than the common cold
- Studies suggest otitis media may negatively effect speech-language development secondary to fluctuating conductive hearing loss associated with middle ear effusion¹
- However, there are inconsistent findings among studies exploring the potential association of otitis media and delayed speech-language development
- Three recent meta-analyses of studies relating otitis media to speech-language delay found little evidence to support impact or risk^{2,3,4}
- Methodological issues in the studies reviewed include small sample size, differing diagnoses (e.g., focus on otitis media with effusion); and failure to control for confounding variables including SES and hearing loss
- Studies suggest that environmental factors including language stimulation may mediate the potential negative developmental impact of otitis media⁵
- Homeless children are at high risk of developmental delay
- Social and environmental stressors may include exposure to domestic violence, residential instability, overcrowded and substandard housing, maternal depression, food insecurity and nutrition deficits
- A New York City study of the developmental status of preschool age homeless children found a speech-language delay rate of 75%⁶
- This is consistent with studies of school-age homeless children. A Los Angeles study found a 78% rate of depression, behavior problems, and/or severe academic delays among sheltered homeless children⁷

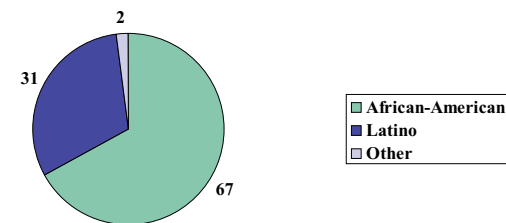
Objective

- To help resolve conflicting findings by exploring the impact of otitis media on speech-language development in a homogeneous high-risk pediatric population, homeless children

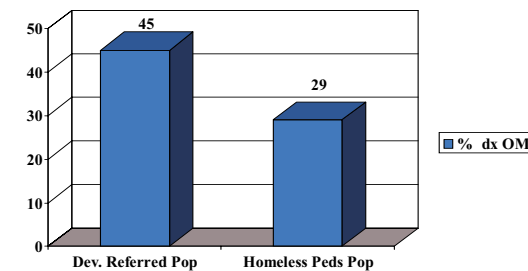
Design/Methods

- All data are derived from delivery of comprehensive primary care in a medical home model
- Electronic and paper patient health records were reviewed
- Otitis media was diagnosed by pediatricians and pediatric nurse practitioners consistent with ICD-9 criteria
- Diagnostic procedures in all cases included otoscopy, and when possible tympanometry
- Behavioral health data were derived from 267 consecutive psychological assessments of homeless pediatric patients referred by their primary care provider during a two year period (1998-99)
- Developmental diagnoses were made by a licensed clinical child psychologist consistent with ICD-9 and where appropriate DSM-IV criteria
- As a control, comparison was made with a contemporaneous study of key health conditions (immunization status, asthma, otitis media, nutrition deficits, lead intoxication) among a representative random sample of 200 homeless pediatric patients enrolled in the same pediatric practice during 1998
- The method was also retrospective chart review⁸

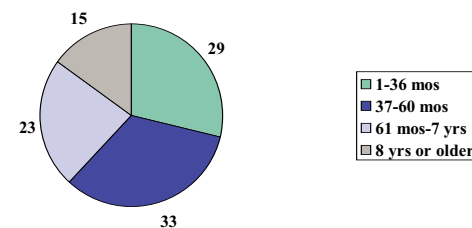
Race-Ethnicity of Developmentally Referred Patients Mirrors Homeless Pediatric Populations



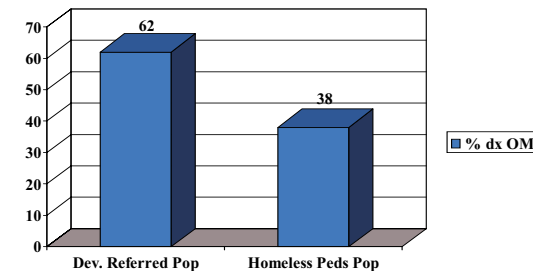
Otitis Media Significantly More Prevalent in Referred Population (p<0.01)



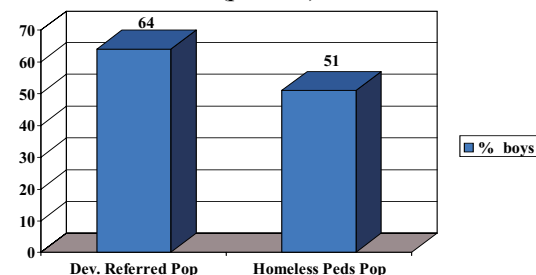
Age of Homeless Children Referred for Developmental Concerns: 62% are 60 months or younger (Mean= 59 months)



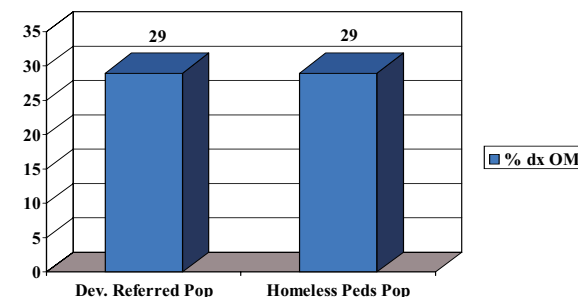
Children ≤ 36 Months: Otitis Media Significantly More Prevalent in Referred Population (p<0.05)



Significantly More Boys in Developmentally Referred Population (p<0.01)



No Difference in Recent Exposure to Domestic Violence



Results

- All of the referred children met criteria for a behavioral health diagnosis, subsequently confirmed by established eligibility for services under IDEA (Early Intervention, preschool or school-age special education programs)
- Otitis media prevalence in the referred population was 45% (mean age, 47 months) compared with 29% (mean age, 33 months) in the control group (p<0.01)
- For children 36 months or younger, otitis media had been diagnosed in 62% of referred patients compared with 38% in the control group (p<0.05)
- For both the referred and control groups, otitis media rates were significantly higher than typical at the time (17%, CDC)
- In the referred population, there was a significant relationship between diagnosed otitis media and a diagnosed developmental delay (p<0.01)
- Neither lead intoxication nor iron deficiency anemia was a significant co-morbidity in the referred population with otitis media
- The prevalence of exposure to domestic violence in the referred population was the same as the control population, 29%

Conclusion

- In this population of high-risk homeless children, there was a significant association between otitis media and a diagnosed behavioral health condition
- Given the multiple environmental stressors experienced by homeless children, this finding is consistent with studies that suggest environmental factors may mediate the potentially negative developmental impact of otitis media
- Our findings suggest that otitis media - or perhaps the fluctuating hearing loss that accompanies middle ear effusion associated with otitis media - may be viewed as a risk factor rather than a cause of delayed development

Implications for Practitioners

- Primary care providers who serve a high risk pediatric population should prioritize patients with otitis media for developmental screening and possible referrals
- To the extent that environmental stimulation may mediate the impact of otitis media on speech-language development, programs that provide language stimulation such as Early Head Start, Head Start and enriched day care may help prevent delays associated with otitis media for high-risk children

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