Recurrent Ear Infections Among American Indians and Alaska Native Children: Evidence From A National Sample

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Background: Seventy-five percent of children experience at least one ear infection by their third birthday (NIDCD 2006). Almost half of these children will have recurrent ear infections (three or more) during their first 3 years (NIDCD 2006). Recent Indian Health Service data suggested outpatient visits for otitis media (the clinical term for ear infection) for American Indian/Alaska Natives (AI/AN) infants were almost three times the national average (Curns et al. 2002). No studies have been conducted to provide national prevalence rates for recurrent ear infections (REI) for AI/ANs. Additionally, no studies were found that compared children from this group to children in other race-ethnic groups. The objective of this research was to fill this gap in the literature and evaluate the risks for REI. The underlying theory for this research is that health disparities are the results of the complex associations between social and physical environments, biology and health behaviors (DHHS 2000).

Objective: To identify the risk factors for REI for AI/AN children compared to other race-ethnic groups.

Methods: National Health Interview Survey 1997–2003 (N=67,576) child sample, adult sample, person, and family files were used. Variables used to predict recurrent ear infections (REI) were categorized as child characteristics, socioeconomic factors, and environmental factors (parental health/behaviors). The unit of analysis was defined as a child whose responding adult was a parent. Children of pregnant parents were excluded to preserve adult body mass index, a measurement for one of the environmental factors. A multivariate logistic regression model that included the following racial-ethnic groups were used to predict REI: non-Hispanic White, non-Hispanic AI/AN, non-Hispanic Black, Mexican Origin, non-Hispanic Asian, non-Hispanic Other, and Other Hispanic. Only variables that generated p-values of .10 in a bivariate regression were included in the multivariate regression. Of the variables considered, both child injury and parental education did not generate a p-value of .10 in a bivariate model. Predictors were not retained in the multivariate model if they were not significant at the α=.05 level. Of the variables considered child sex and household poverty status were not associated with REI at the α=.05 level. Thus, the model presented here is parsimonious. Missing data were imputed using PROC MI, the multiple imputations procedure, in SAS® 9.1 software. The exception was parental BMI. The National Center for Health Statistics (NCHS) recommends against imputing BMI. Sampling weights were used to produce correct point estimates. SUDAAN® statistical software was used to account for the complex sample design to obtain appropriate variance estimates (standard errors) for the multivariate estimates.

Results: A greater proportion of AI/AN children (9.1%, CI 5.5 – 14.6%) were diagnosed with REI by a health professional compared to other race-ethnic groups (range 3.1% [CI 2.4 – 7.4%]

to 7.4% [7.1 – 7.7%]). The child characteristics that were significantly associated with REI were race-ethnicity, age, birth weight, having at least one health limitation, and having been diagnosed with asthma by a health care professional (as reported by parent). NHIS data are retrospective, no prospective, so it is not accurate to say these variable "predicted" REI. The socioeconomic factors that significantly presented risk were having only one parent in the home and having government insurance. Having Indian Health Service as primary insurance was did not protect against REI. The parental health behaviors that were predictive of REI were use of alcohol, smoking, self-rated health, weight status and parental asthma. AI/AN children were the only race-ethnic group at risk for REI compared to non-Hispanic Whites. However, given the small number of AI/ANs represented in the sample, this result was not significant (OR 1.05 in full model).

Conclusions: Overall, this research demonstrated that AI/AN children are at greater risk for REIs compared to the other identifiable racial-ethnic groups included in this research. Although this group is a very small proportion of the U.S. population, the health of AI/ANs is demonstrative of the long-term commitment the U.S. government made (and continues to make) to AI/AN tribes.

References

Curns AT, RC Holman, DK Shay, JE Cheek, SF Kaufman, RJ Singleton, and LJ Anderson. 2002. Outpatient and hospital visits associated with otitis media among American Indian and Alaska Native children younger than 5 years. *Pediatrics* 109(3): E41.

National Institute on Deafness and Other Communication Disorders (NIDCD). 2006. *Otitis Media (Ear Infection)*. Access date October 16, 2006, http://www.nidcd.nih.gov/health/hearing/otitism.asp.

U.S. Department of Health and Human Services. 2000. *NIH Strategic Research Plan to Reduce and Ultimately Eliminate Health Disparities*. Access date October 3, 2006, http://www.nih.gov/about/hd/strategicplan.pdf.