Introduction

Hearing loss is an important occupational illness among farmers. Use of agricultural equipment such as grain chutes and tractors, as well as engaging in tasks such as working around livestock, have been associated with hearing loss. However, associations between total lifetime exposure duration and hearing loss are not well established among farmers.

The purpose of this study was to examine the effect years participating in common agricultural activities have on measures of hearing loss.

Methods

- Agricultural exposure, covariate and audiometric data were collected from 1,568 adults participating in a large occupational health study of rural residents.
- Agricultural exposures of interest were collected using questionnaires and included:
  - Farmer vs. non-farmer
  - Years worked at noisy job other than farming
  - Years hunting or target shooting
  - Years ATV or motorcycle use
  - Years chain saw use
  - Years pneumatic or electric tool use
  - Years lived on a farm
  - Years worked on a farm
  - Years operated tractor without a cab
  - Years operated tractor/combine with a cab
  - Years grain dryer, feed mill, or hay chopper use
  - Years worked with livestock
  - Years worked in hog confinement building
- Hearing loss was ascertained using standard audiometric methods (ANSI 1996b).
- Three pure tone average (PTA) calculations were used to characterize hearing loss from the audiograms:
  - NIOSH = PTA of 1000Hz, 2000Hz, 3000Hz and 4000Hz
  - Low Frequency = PTA of 250Hz, 500Hz, 1000Hz and 2000Hz
  - High Frequency = PTA of 3000Hz, 4000Hz and 6000Hz
- Multiple logistic regression analyses were performed to examine associations between agricultural exposures and three dichotomized hearing loss outcomes (PTA ≥ 25 dB) while controlling for potential confounders.
- Multiple linear regression analyses were performed to examine associations between agricultural exposures and three continuous hearing loss outcomes while controlling for potential confounders.

Results

Even though the farmers had more hearing loss than non-farmers, many of the agricultural activities that these farmers reported were not associated with hearing loss.

Odds ratios and parameter estimates for the statistically significant agricultural exposures indicate that relatively long durations were required before substantial hearing loss would develop.

Because actual noise exposure could vary greatly, years engaging in agricultural activities may not be the most appropriate metric for predicting hearing loss. As a result, these agricultural exposures may be a poor representation of actual lifetime exposure to noise. A more accurate analysis of the associations between these agricultural exposures and hearing loss could be conducted if a more audiological relevant metric for agricultural exposures was used.

Future work is needed to measure the actual noise exposures of these agricultural activities to accurately predict the risk of developing hearing loss.

Conclusions

References


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