COMMENT ON ''MORTALITY AND CAUSE OF DEATH IN HEARING LOSS PARTICIPANTS: A LONGITUDINAL FOLLOW-UP STUDY USING A NATIONAL SAMPLE COHORT''

To the Editor: We recently reviewed the article published by Kim et al. (1) in the human communication epidemiology research group. The study aims to estimate the risk of mortality in subjects with severe and profound hearing loss according to the cause of death. The authors assume that changes in the auditory system lead to a greater risk of serious falls that lead to death (1).

In studies in which the causal chain of diseases and illnesses are analyzed, depending on the basic epistemological and epidemiological framework, it is recommended that the links between the exposures and the outcome studied, as well as the variables related to exposure and outcome even if they are not the objective of the study, must be considered in the analysis models (2). Furthermore, considering that the planning of a study requires theoretical models defined a priori and based on the existing literature in addition to the definition of the statistical analyzes to be performed, including the covariables that will be inserted in the analysis models that will be performed reduces the probability that relevant variables are left out of the necessary adjustments for proper testing of the hypotheses on screen (3,4). In this case we refer mainly to confounding factors, since not considering these can, among others, lead researchers to find spurious associations (5). Literature research on the relationship between severe and profound hearing loss from the age of 40 and over and mortality rates opens a relevant range of possibilities already explored before (6–13) and not explored by the authors in the discussion or even in the fragilities of the study.

Analyzing Table 1 of the manuscript, in which the authors present the characteristics of the studied population, there is a high proportion of subjects from the rural area in both groups of hearing impaired, severe and profound (59.7 and 65.1%, respectively) (1). The two studies previously carried out and cited by the authors (Genther et al., 2015) (14) and Karpa et al. (15) have lower hazard ratio and do not present information on the residence of their population (if rural or from the cities).

We think that an important causal factor related to mortality and hearing loss in the researched population, exposure to pesticides and agrochemicals (16–18), was not considered by the authors in their analysis and in the discussion of the data. This is an important and current element of causation of health problems in death, as highlighted in the literature (19). Despite the fact that modern epidemiology demonstrates that health transposes the individual level of understanding of the health-disease process, it is also necessary to consider individual aspects such as the period of acquisition of hearing loss, whether acquired or congenital, labor aspects and exposure to noise and health-related aspects (5), such as self-perceived health (20), access to health services (21), and other associated psychological disorders (22,23), as these are related to both exposure and outcome under study and, although this information was not available for the study, it should be considered in the discussion of the findings.

The discussion and conclusions are not fully supported by the presented methodology and results. Hearing is a complex system and the relationship between hearing loss and death is possibly not a direct cause. Thus, we highlight the importance of a critical and cautious reading of the data presented, especially in relation to its application in health policies and clinic.

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REPLY TO THE COMMENT ON MORTALITY AND CAUSE OF DEATH IN HEARING LOSS PARTICIPANTS: A LONGITUDINAL FOLLOW-UP STUDY USING A NATIONAL SAMPLE COHORT

In Reply: We appreciate the comments and agree to the opinion. As we described in the discussion section, it was limitations of our study that some variables, including duration of hearing impairment and the exposure to pesticides and agrochemicals, could not be considered. The indirect association of hearing impairment with mortality could not be totally excluded in the current data (1). The current results demonstrated the rate of mortality due to all causes were 4.03 times higher in severe hearing impairment patients than the control participants. The causality could not be delineated in the present study. To attenuate the confounder effects, the comorbidities were adjusted and the mortality rate was analyzed according to the cause of hearing impairment as presented in Table 4 (1).

As pointed by comments, Table 1 described the high proportion of subjects from the rural area in both severe and profound hearing impairment (59.7 and 65.1%, respectively) (1). Because the region of residence could influence to both hearing impairment and mortality due to the medical accessibility and environmental pollutants (2), the control groups were matched for the region of residence in this study. For the similar reason, the age, sex, and income were matched between hearing impairment and control groups. In addition, only the 1.97% (1,020,828/51,826,059) of Korean was engaged in agriculture according to the 2018 Korean Statistical Information Service (3). Most previous reports on the mortality in hearing impaired patients have limitations on the possible confounder effects due to the unconcerned environmental factors (4,5).

The heterogeneous types and durations of hearing impairment is another shortcoming of the present study. To attenuate the differences from the degree of hearing impairments, this study used the hearing handicap criteria of Korea. The potential relations between hearing impairment and mortality were discussed and these need to be tested in future randomized cohort study considered these possible confounders. However, the current study was in line with other studies suggested the contribution of hearing impairment of mortality and improved the previous findings by analyzed according to the cause of mortality. Although a few possible confounders was existed and the direct impact of hearing impairment on mortality could not be concluded, this study presented the higher rate of mortality in hearing impairment patients compared with control group, which might be clinically meaningful.

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