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## The Increased Incidence and Risk of Developing Sensorineural Hearing Loss on Chronic Kidney Disease from Multiple Nationwide Health Screening Records : A Systematic Review and Meta-Analysis

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**Objectives :** Chronic kidney disease (CKD) is a significant health problem worldwide. Sensorineural hearing loss (SNHL) was sporadically reported as a complication of CKD, with limited to no high-quality studies examining the potential association. This meta-analysis aims to investigate whether CKD patients had higher risk of developing SNHL.

**Methods :** This study was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020. All studies were screened using PubMed and Scopus from 2013 to 2023. Studies using ICD-10 codes in various national health screening cohort were specifically included. The exposure and outcome of interest was the coding of appropriate ICD-9 or ICD-10 of CKD and SNHL, respectively. Newcastle-Ottawa Scale (NOS) was used to measure the quality of the studies. Statistical analysis was carried to determine incidence rate difference (IRD) and hazard ratios (HR) of SNHL in CKD group.

**Results :** This meta-analysis comprised of 4 retrospective cohort studies, including 241,596 patients with CKD and 665,707 patients with non-CKD (n= 907,303). The quality scores of the selected studies were acceptable, with NOS scores of 8–9 points. The median of studies follow-up were 10 years (range: 5-17). The incidence of SNHL in CKD group is higher than non-CKD group (pooled IRD 0.30/1000 PY, 95% Confidence Interval [CI]: 0.21–0.39). The risk of developing SNHL in CKD group was significantly higher (HR 1.89, 95% CI: 1.05 - 3.43, I<sup>2</sup> = 97.0%). Subgroup analysis revealed the heterogeneity was probably attributed to the differences between sex among participants (Female: HR 2.36, 95% CI: 0.93 - 0.64, I<sup>2</sup> = 96.0%) than male (HR 1.91, 95% CI: 0.92 - 3.94, I<sup>2</sup> = 96.0%).

**Conclusions :** This study revealed that the incidence of developing SNHL was higher in patients with CKD and higher risk 2.3 times in female compared to 1.9 times in male.

Figure 1 Hazard Ratio of SNHL.png

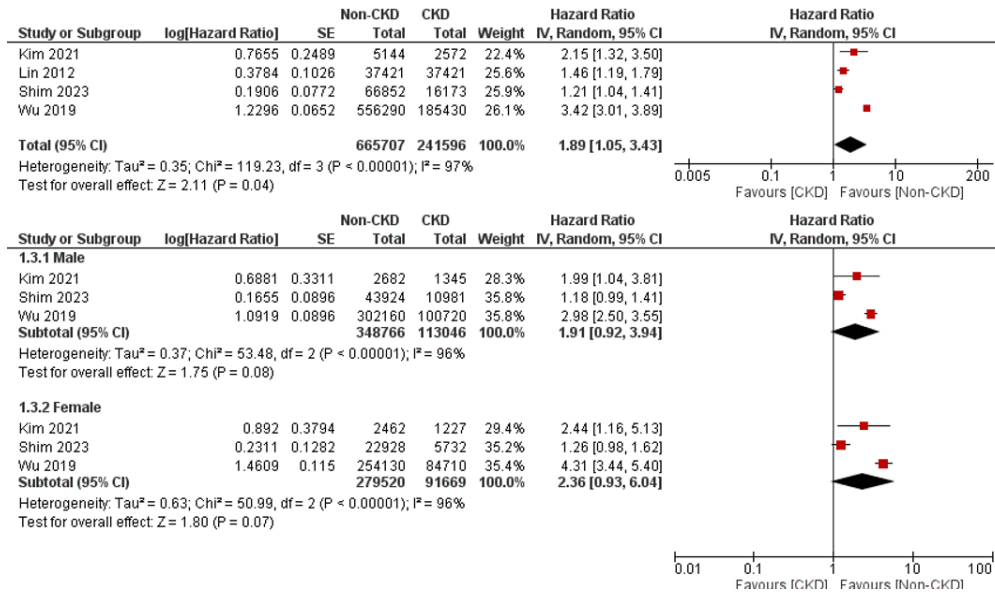


Figure 1 Hazard Ratio of SNHL.png

