

ORIGINAL RESEARCH—ERECTILE DYSFUNCTION

A Case-Control Analysis on the Association Between Erectile Dysfunction and Sudden Sensorineural Hearing Loss in Taiwan

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ABSTRACT

Introduction. Although the cause of sudden sensorineural hearing loss (SSNHL) is yet to be elucidated, many theories have been proposed regarding potentially contributory etiologies. One increasingly well-supported theory purports an underlying vascular pathomechanism. If this is the case, SSNHL may also associate with conditions comorbid with vascular diseases, such as erectile dysfunction (ED). However, no studies to date have investigated the association between ED and SSNHL.

Aim. This study set out to estimate a putative association between ED and having been previously diagnosed with SSNHL using a population-based dataset with a case-control design.

Methods. This study used administrative claim data from the Taiwan National Health Insurance program. We identified 4,504 patients with ED as the study group and randomly selected 22,520 patients as the comparison group. Conditional logistic regression was used to examine the association between ED and having previously received a diagnosis of SSNHL.

Main Outcome Measure. The prevalence and risk of SSNHL between cases and controls were calculated.

Results. Of the sampled patients, 41 (0.15%) had been diagnosed with SSNHL before the index date; 22 (0.49% of the cases) were from the study group and 19 (0.08% of controls) were from the control group. Conditional logistic regression analysis revealed that after adjusting for the patient's monthly income, geographic location, hypertension, diabetes, hyperlipidemia, coronary heart disease, obesity, and alcohol abuse/alcohol dependence syndrome status, patients with ED were more likely than controls to have been diagnosed with SSNHL before the index date (odds ratio = 6.06, 95% confidence interval = 3.25–11.29).

Conclusions. There was an association between ED and prior SSNHL. The results of this study add to the evidence supporting an underlying vascular pathomechanism regarding the development of SSNHL and highlight a need for clinicians dealing with SSNHL patients to be alert to the development of ED. **Keller JJ, Chen Y-K, and Lin H-C. A case-control analysis on the association between erectile dysfunction and sudden sensorineural hearing loss in Taiwan. J Sex Med 2012;9:1411–1417.**

Key Words. Erectile Dysfunction; Sudden Sensorineural Hearing Loss; Hearing Loss; ED; ED Treatments and Auditory Changes

Introduction

Sudden idiopathic hearing loss is an acute dysfunction of the inner ear most often presenting with a rapid unilateral onset [1]. Although some earlier estimates reported only 5–20 cases

per 100,000 persons per year [2], which contributed to its status as an “orphan disease” by both the European Medicines Agency (EMA) and the American Food and Drug Administration (FDA) [1], the literature regarding SSNHL incidence has been noted to be nonrepresentative, outdated, and

perhaps on account of diagnostic differences and high remission rates to vary by a factor of 125 [3]. In response to these inadequacies, recent investigations have been taken up in Germany which found sudden sensorineural hearing loss (SSNHL) to affect up to 300 out of 10,000 persons per year, which is a far cry from meeting the criteria for a rare disease according to the criteria of World Health Organization (WHO) and the European Union, which stipulates a prevalence of under 50 per 100,000 inhabitants [3,4]. Women and men are approximately equally affected, with the peak age-related incidence occurring between the ages of 50 and 60 [1]. While the causes of sudden hearing loss are not yet known, many theories have been proposed to explain its comorbidities with other diseases. One such theory involves an association with an underlying vascular mechanism [5]. If there is indeed an underlying vascular pathomechanism, SSNHL may also associate with conditions comorbid with vascular diseases, such as erectile dysfunction (ED) [6].

ED is defined as the inability to achieve or maintain an erection sufficient for satisfactory sexual intercourse and is the most common sexual problem among aging men [7,8]. ED affects up to one-third of men during their lives and can have a negative impact on intimate relationships, quality of life, and self-esteem [9].

While both SSNHL and ED are both associated with cardiovascular risk factors, no large scale population-based study has been conducted to investigate the possibility of an association between ED and SSNHL. Therefore, using a nationwide population-based dataset in Taiwan, we aimed to examine the association between ED and a prior diagnosis of SSNHL by comparing the risk of prior SSNHL between patients with ED and matched controls.

Methods

Database

The data for this matched, case-control study were sourced from the Taiwan Longitudinal Health Insurance Database 2000 (LHID2000), which is derived from the Taiwan National Health Insurance (NHI) program. The LHID2000 includes the original claim data and registration files of 1,000,000 enrollees randomly selected from the 2000 Registry for Beneficiaries (N = 23.72 million) of the Taiwan NHI program. The Taiwan National Health Research Institute reports that there is no significant difference in the gender distribution

between the patients selected for inclusion in the LHID2000 and all the patients enrolled in the NHI program. Numerous researchers have utilized the LHID2000 to conduct and publish their studies in internationally peer-reviewed journals [10–13]. The LHID2000 provides an exclusive opportunity for us to explore the association between ED with SSNHL.

This study was exempted from full review by the Taipei Medical University Institutional Review Board as the LHID2000 consists of de-identified secondary data released to the public for research purposes.

Selection of Cases and Controls

We identified 4,606 patients who were ≥ 40 years old and had received their first diagnosis of ED (impotence, organic [ICD-9-CM code 607.84]) during ambulatory care visits between January 2002 and December 2009. In Taiwan, ED is diagnosed based on the results of a self-administered International Index of Erectile Dysfunction-5 questionnaire. Although the raw scores of this questionnaire were not available in our administrative dataset, we believe that the ED diagnoses in our dataset had high validity on account of the cultural taboos associated with visiting a physician for sexual problems in Taiwan. Furthermore, we only included patients who had been diagnosed with ED at least twice during the period between 2002 and 2009, with at least one diagnosis being made by a urologist. We considered the first ED diagnosis as the index date in this study. We also excluded all the patients who had received a diagnosis of SSNHL prior to the 5-year study period immediately preceding the index date (N = 102). Finally, 4,504 patients with ED were included as cases in this study.

We also selected five matched controls (N = 22,520) per case from the remaining subjects of the LHID2000. Controls were matched with cases in terms of age in intervals of 10 years (40–49, 50–59, 60–69, and >69), monthly income, urbanization level, and index year. We matched monthly income and urbanization level between cases and controls to better select for cases and controls with greater similarity with regard to unmeasured neighborhood socioeconomic characteristics. We also made certain that none of the selected controls had ever received a diagnosis of ED between 1996 and 2009. (The data in the LHID2000 were available after 1996.) As with the cases, we assigned the first use of medical care occurring during the index year as the index date for controls.

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